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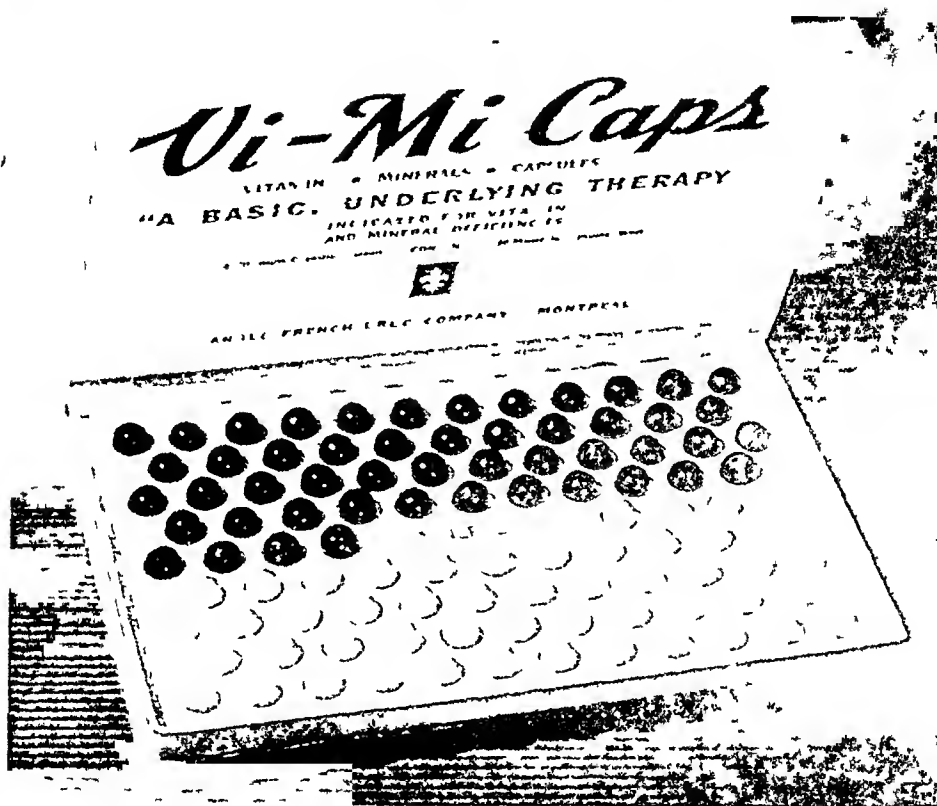
BALANCED NUTRITIONAL SUPPLEMENTS

Vi-Mi Caps

VITAMINS

2550

CAPSULES



Integral Vitaminotherapy Associated to Minerals

DOSAGE 1 Vitamin and 1 Mineral capsule daily is the average dose for Adults and for Children For increased effect 2 of each capsule may be given to Adults

HOW SUPPLIED In boxes of 100 capsules—50 Vitamins (green) 50 Minerals (white)

Samples on request from

ANGLO-FRENCH DRUG CO Ltd — 209 St Catherine Street East — MONTREAL

For Arthritis - Chronic Rheumatism SULFOSALYL

Containing the three salicylates sulphur, calcium, thyroid and parathyroid in enteric coated capsules, dissolving in the intestines, thus avoiding gastric irritation

Samples on request from

ANGLO-FRENCH DRUG CO. Ltd — 209 St Catherine Street E
MONTREAL

At your Service
"BEMINAL"
 for B complex

The Ayerst group of vitamin B complex preparations provides six solutions to the problem of B complex administration a variety of forms and potencies which facilitates selection of the most suitable treatment for each patient



AYERST, McKENNA & HARRISON LIMITED • Biological and Pharmaceutical Chemists • MONTREAL, CANADA

378

Brand



Synthetic

NEO-DIUROSAN

For the relief of ASTHMA it has been found that Aminophylline is particularly effective. When combined with Phenobarbitone and Ephedrine results are even more satisfactory.

Each Tablet contains

Aminophylline	2½ grains
Phenobarbitone	¼ grain
Ephedrine	⅜ grain

DIUROSAN

In treating Cardiac Crisis aggravated by emotional stress, Cheyne-Stokes respiration, Arterio-sclerosis and Hypertension, Aminophylline plus the sedative action of Phenobarbitone gives excellent results.

Each Tablet contains

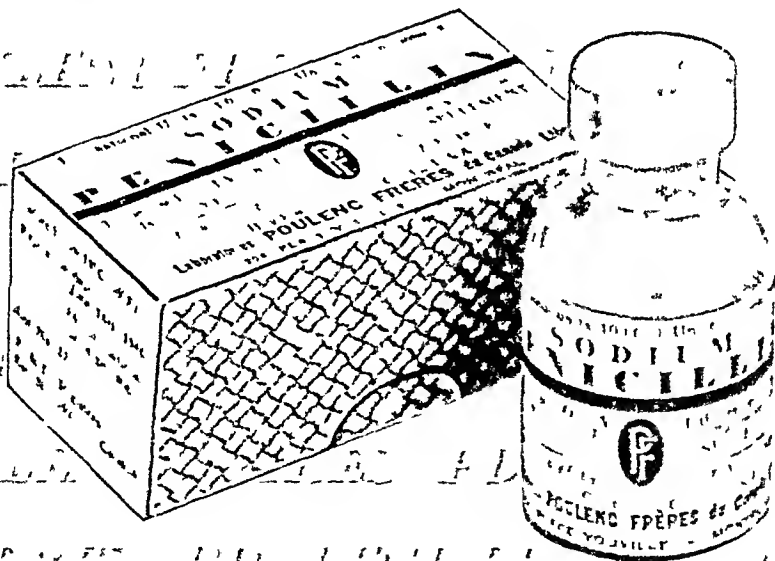
Aminophylline	1½ grains
Phenobarbitone	¼ grain

Presented in bottles of 100 and 500 Tablets

SYNTHETIC DRUG COMPANY LIMITED

What's in a Name

The name *Poulenc* on such valuable
drugs as Penicillin is your assurance of
getting a highly ethical
specialty



Laboratory Poulenc Frères

OF CANADA LIMITED - MONTREAL



Nothing is more important . . .

to the human body than liquids. Hunger can be endured for days and weeks—thirst is unendurable.

And as liquids are important, so also are the organs of the body that control the balance of liquids and purify them in the system.

That is why URASAL is important. It ensures normal, healthy kidney function. The antiseptic properties of hexamine combined with the solvent qualities of lithium benzoate, lithium citrate

and piperazine make Urasal valuable in chronic and mild infections of the urinary tract.

Each year physicians in increasing numbers prescribe URASAL (Horner)—

- 1 To clear up urinary infection
- 2 To relieve backache, rheumatic pains and gout



FRANK W HORNER LIMITED

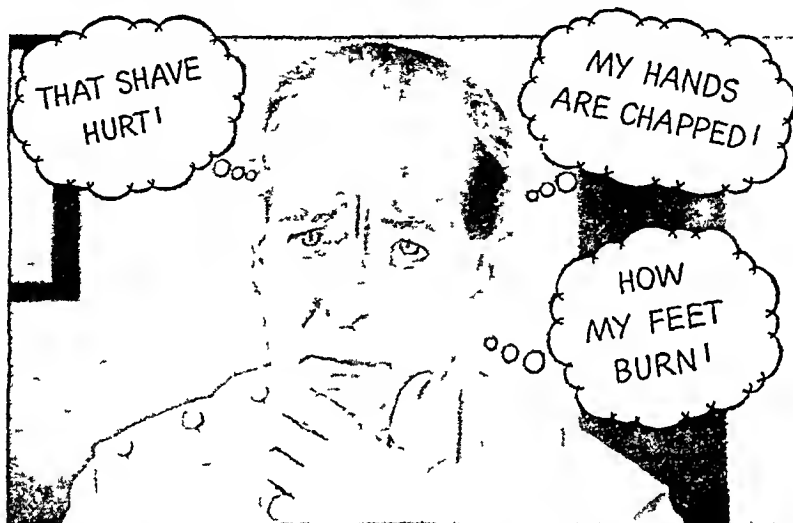
Clinical experiences have demonstrated
that the administration of xanthines may
double coronary circulation and allow a
greater amount of work to be performed.



XANTOPHEN

ROUGIER FRERES, 350 Le Moyne Street, MONTREAL (1)

Don't let these irritations make you short-tempered!



Try the soothing, greaseless cream that's helped scores of doctors!

● Don't let nagging, everyday skin troubles make you irritable! Scores of doctors get quick, soothing relief with the medicated cream, Noxzema. Noxzema is snow white, greaseless, vanishes almost at once.

Actual clinical tests show that it relieves and helps heal sore, red, chapped hands — often *overnight!* Rub a little into your tired, burning feet, see how soothing and cooling it feels!

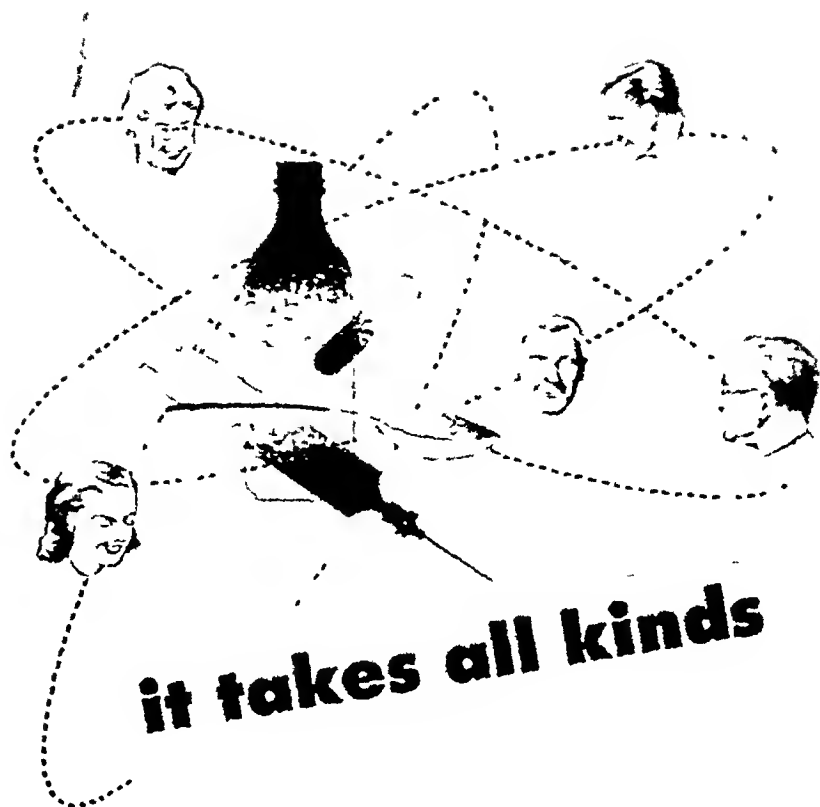
And, especially if you have a tough beard or sensitive skin, use Noxzema for shaving! Try it as a brushless or before lathering, and

see what a smooth, close, easy shave it gives you — how soft and smooth your skin feels afterward!

For your information, regular Noxzema Skin Cream is a modernization of Carron Oil, fortified by adding Camphor, Menthol, Oil of Cloves and less than ½% of Phenol in a greaseless, solidified emulsion. Its reaction is almost neutral — the pH value being 7.4.



NOXZEMA



it takes all kinds

• Since the severity of pernicious anaemia differs widely, treatment is facilitated when a variety of products is available. From the four standardized preparations of Ayerst's Liver Extract, the physician can choose the formula suited to the requirements of each patient.

AYERST LIVER EXTRACTS

POWDER (No. 915)—a palatable powder form

LIQUID (No. 936)—a palatable extract

CAPSULES (No. 350)—convenient and pleasant

INJECTABLE (No. 499)—for intramuscular use



AYERST McKENNA & HARRISON, LIMITED • Export and Wholesale • Montreal, Canada



... the characteristic response

THE prompt symptomatic relief-provided by Pyridium is extremely gratifying to the patient suffering with distressing urinary symptoms such as painful, urgent, and frequent urination, tenesmus, and irritation of the urogenital mucosa.

Pyridium is convenient to administer, and may be used with complete safety throughout the course of cystitis, pyelonephritis, prostatitis, and urethritis
The average oral dose is 2 tablets t i d.

PYRIDIUM
Trade Mark Registered
(Phenylazo alpha alpha diamino-
pyridine mono hydrochloride)

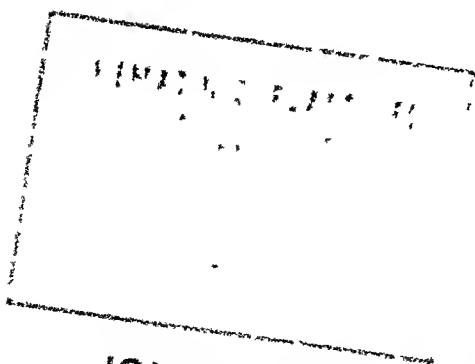
For gratifying relief of
distressing symptoms in
urogenital infections

Pyridium is the Canadian Registered Trade-Mark of the
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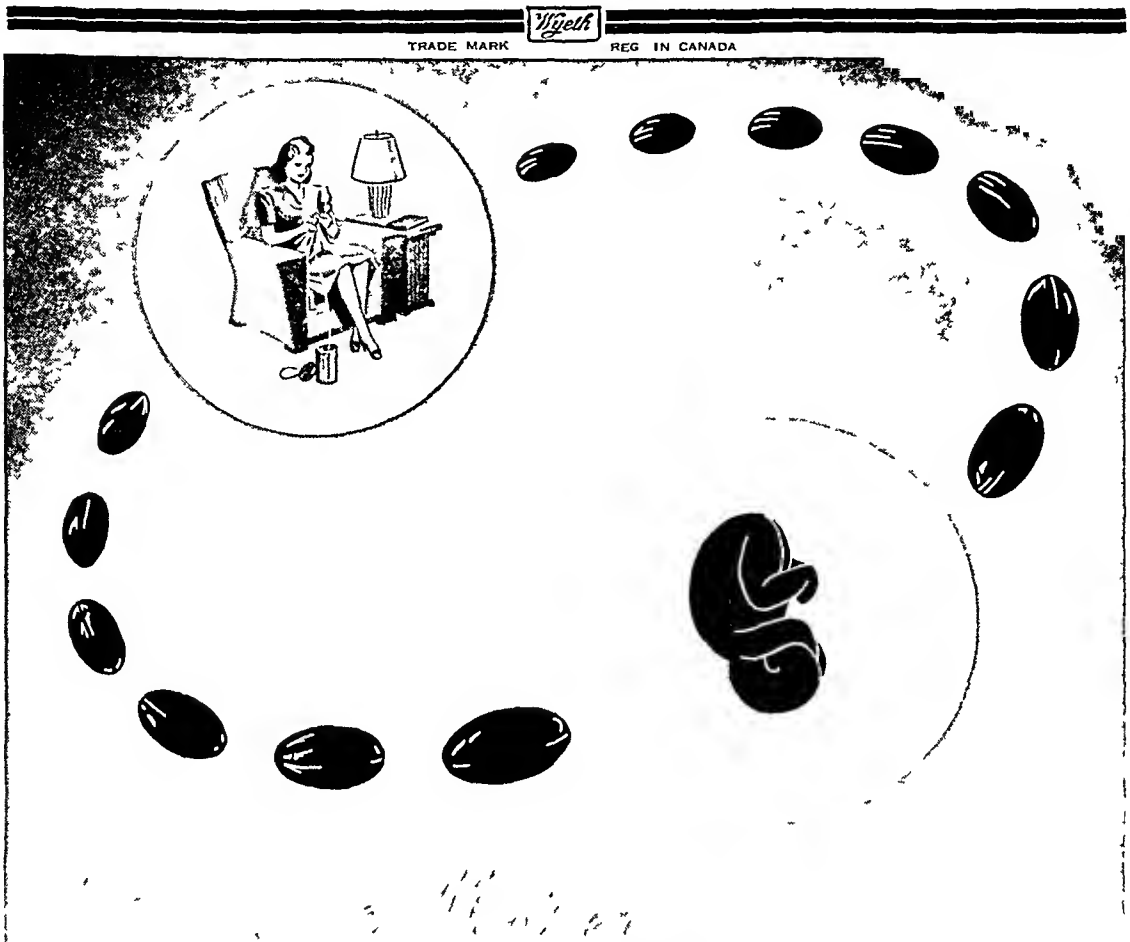
*Iron
Deficiency
& Anemia*

HEMATINIC
PLASTULIN

- PREPARED BY
- LABORATORIES



JOHN WYETH & BROTHERS PHARMACEUTICALS, LIMITED



CAROTENE SAFEGUARDS BOTH MOTHER AND CHILD

Vitules*

The Only Multivitamin Capsule Containing CAROTENE

FOR MOTHER—a generous supply of all essential vitamins, well above the minimum daily requirements

FOR BABY—an adequate supply of CAROTENE, the important source of vitamin A for the fetus, as well as substantial amounts of other essential vitamins

*Trade Mark Reg. in Canada

VITULES†
IMPROVED FORMULA VITAMIN CAPSULE
Supplied in bottles of 30 and 100



TRADE MARK REG. IN CANADA

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FATS
CARBOHYDRATES
VITAMINS
and now
AMINO ACIDS
a ready source of
PROTEINS



AMINYL*
POWDER

AMINYL is a preparation

containing all the Essential Amino Acids, 35% with added Tryptophane Total Amino Acids Hydrolysate content 85%

INDICATIONS — Gastric or duodenal ulcers, vomiting, diarrhea, dysentery, food allergies, pregnancy and lactation, before and following operations, burns and shock

DIRECTIONS — Especially prepared for administration by adding to hot or cold liquids such as milk Supplied in 4 oz and 16 oz bottles

A



PRODUCT



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London - - - - - Canada

Braided for non-slip knots....
.... black for identification

... *Black Braided*

ETHICON

Johnson & Johnson



X-RAY AND RADIUM INDUSTRIES LTD
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RADIUM-POLONIUM

Radio-active research has made another product available for therapeutic use

We are proud to announce that we now have a source of supply of POLONIUM (chloride or nitrate) in commercial quantities, or in POLONIUM-BERYLLIUM mixtures for neutron sources

If you are interested in the purchase of RADIUM or POLONIUM in any form, or other radio-active products, be sure to consult us for any quantity large or small

Through this organization, RADIUM and a complete line of RADIUM accessories were first made available in Canada in useable form

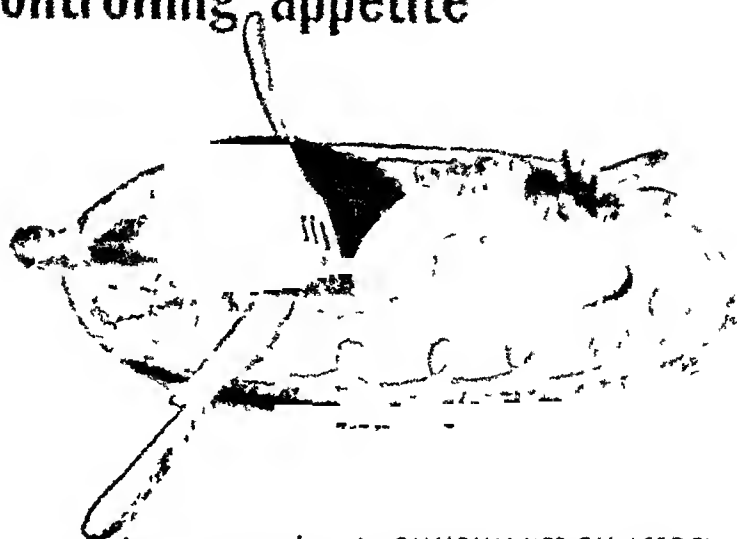
In addition to being pioneers in this field, we have the most modern and safely equipped RADIUM laboratory in Canada Our staff of physicists and engineers are long experienced and able to serve you in such ways as repairing old needles or tubes, converting to newer type containers, leakage tests, and distribution of RADIUM in the container

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Stocks are maintained for your convenience in all principal distributing centres across the Dominion

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X-RAY and RADIUM INDUSTRIES LTD.

highly effective in controlling appetite



In a recent article in the CANADIAN MEDICAL ASSOCIATION JOURNAL,* Dexedrine is appraised as "a very useful appetite depressant drug in the treatment of obesity"

The authors found that DEXEDRINE enabled overweight patients to adhere closely to a restricted diet "without feeling it too great a burden"

Dexedrine is also indicated in the treatment of depressive states, alcoholism and allied conditions. Exerting a sustained cerebral and psychomotor stimulation, Dexedrine is particularly valuable whenever the physician wishes to administer a drug combining preponderant central nervous effect with relatively weak peripheral activity.

*Journal of the American Medical Association, 1954, 157: 1021

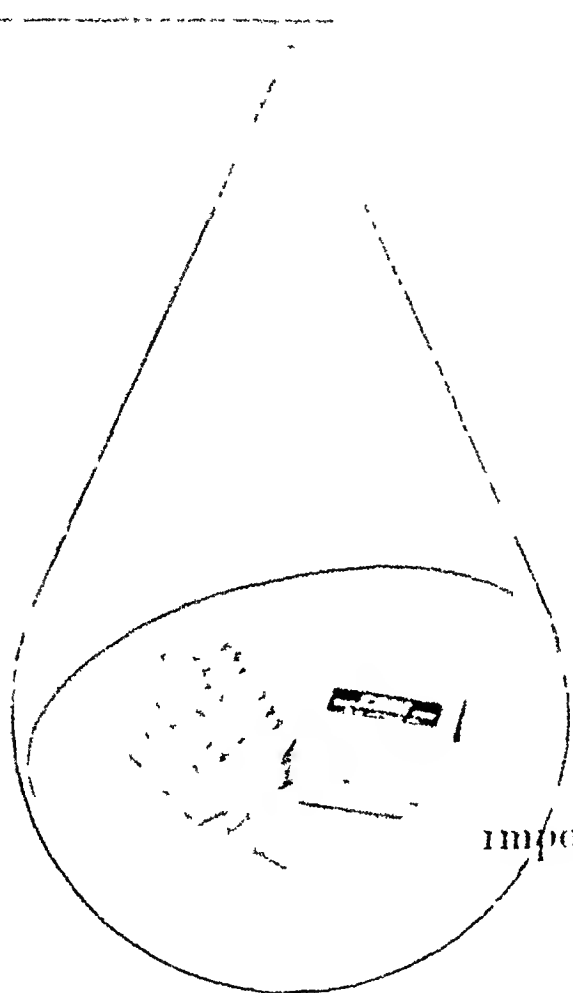
Dexedrine Sulfate Tablets

Dexedrine Sulfate Tablets are manufactured by Smith, Kline & French Corporation, Philadelphia and Montreal

(Dextro amphetamine sulfate, S. K. F.)

Smith, Kline & French Inter-American Corporation
Philadelphia and Montreal

chemotherapy in oral and pharyngeal infections



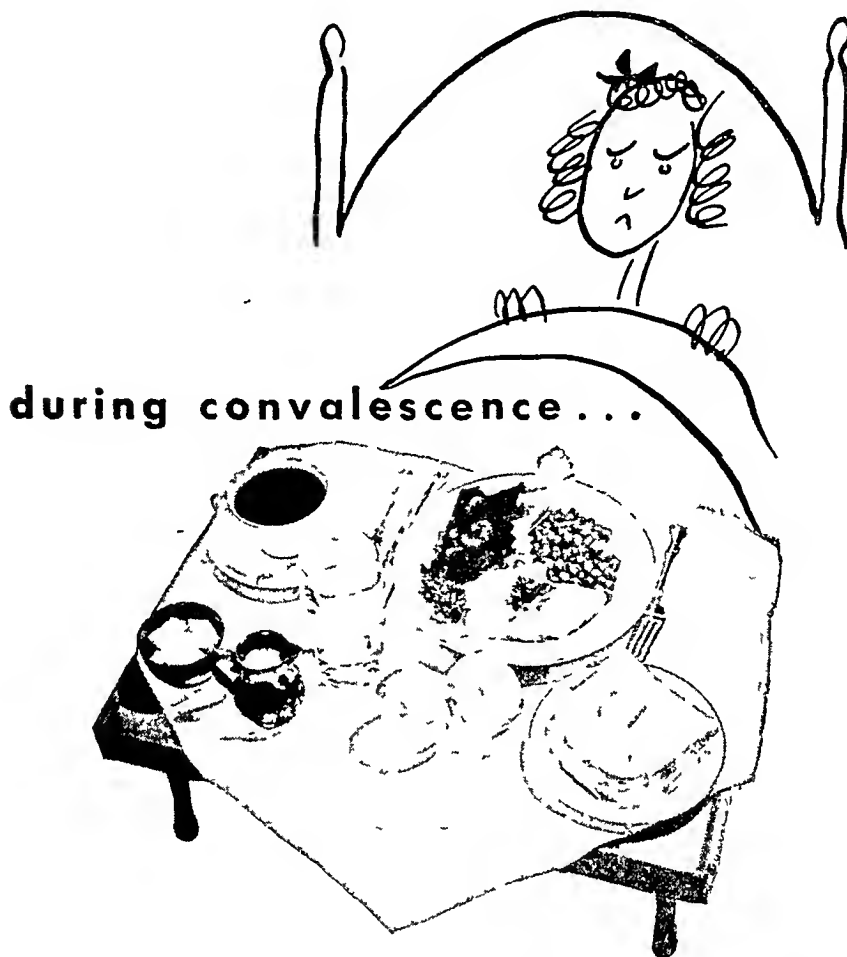
1. Ulfathiazole gum is a new, effective, and safe preparation for the treatment of oral and pharyngeal infections.
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3. The product is a new, safe, effective, and safe preparation for the treatment of oral and pharyngeal infections.
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Supplied in packets of 25 and 50 mg. Ulfathiazole gum is a new, safe, effective, and safe preparation for the treatment of oral and pharyngeal infections.

important

Ulfathiazole gum is a new, safe, effective, and safe preparation for the treatment of oral and pharyngeal infections.

ulfathiazole gum



the intake of essential nutritional factors often falls far below the level necessary for optimum recovery

ESKAY'S NEURO PHOSPHATES is a time-tested tonic, highly effective in restoring appetite. And, because this preparation is exceptionally palatable and easily tolerated, the patient will take it regularly and in adequate dosage for as long as the physician directs

Eskay's Neuro Phosphates

Clinically approved and universally accepted

Smith, Kline & French Inter American Corporation • Philadelphia Montreal
Canadian Distributors: The Leeming Miles Co., Ltd., Montreal

MULTI-VITAMIN THERAPY in drop doses





"THEOLAMINE" TABLETS

' THEOLAMINE
CCT No 313 *Tablet*

Theolamine 1½ gr

' THEOLAMINE
and PHENOBARBITAL
CCT No 326 *Tablet*

Theolamine 1½ gr
Phenobarbital ¼ gr

Dose 1 or 2 tablets three times daily

Available in bottles of 100 and 500 tablets

THEOLAMINE and DIGITALIS
CCT No 314 *Tablet*

Theolamine 1½ gr
Digitalis 1 gr (0.65 Int unit)

"THEOLAMINE and 'NOCTINAL
ECT No 412 *Tablet*
(Enteric Coated)

Theolamine 3 gr
*Noctinal ½ gr

Dose 1 tablet three times daily

"THEOLAMINE" AMPOULES

Ampoule No 541 *Inject*

Theolamine 7½ gr (0.5 G)
Distilled water to 10 cc

Dose 10 to 20 cc injected slowly (3-5 minutes) intravenously and repeated every 6 hours if necessary

Available in boxes of 6 and 25 ampoules

Ampoule No 545 *Inject*

Theolamine 3¾ gr (0.25 G)
Distilled water to 10 cc

For the Treatment of

**1. CARDIAC PAIN of CORONARY
INSUFFICIENCY**

(Angina Pectoris • Coronary Sclerosis • Late effects of Syphilis • Arterio-

2. NON-SPECIFIC ASTHMA

3. BILIARY COLIC

For the Treatment of **FUNCTIONAL CONSTIPATION**



A SUPERIOR COLLOIDAL TYPE OF MINERAL OIL EMULSION

Kondremul is a gentle and effective laxative. It is pleasant to take, pours easily from the bottle, mixes well with water or milk, and is non habit-forming. Irish Moss (*Chondrus Crispus*), used as the emulsifying and protective colloid, results in a highly dispersed, stable emulsion, resistant to temperature, dilution and digestion. Kondremul mixes intimately with intestinal contents and produces a soft stool easily passed without straining. Embarrassing leakage almost never occurs.

"KONDREMUL" with B₁

A palatable emulsion containing 55% mineral oil, and 200 International Units B₁ per fluid ounce. May be used as a regulative for children as well as adults.

Bottles of 8 and 16 fl. oz.

'KONDREMUL" with CASCARA SAGRADA

Combines the tonic laxative action of non bitter Extract of Cascara with the effects of Kondremul.

Bottles of 16 fl. oz.

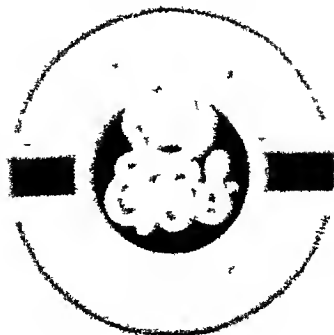
"KONDREMUL" with PHENOLPHTHALEIN

Laxative and regulative. Contains 2.2 grs phenolphthalein per tablespoonful.

Bottles of 8 and 16 fl. oz.

We will be pleased to supply a regular size package of any type for your home use on request.

• THE QUALITY SYMBOL •
OF PHARMACEUTICAL PRODUCTS



**WHEN THE NATURAL
PRODUCTION OF
MALE SEX
HORMONE**

DIMINISHES with declining gonadal function, replacement therapy with ORETON will offset the androgenic inadequacy.

ORETON

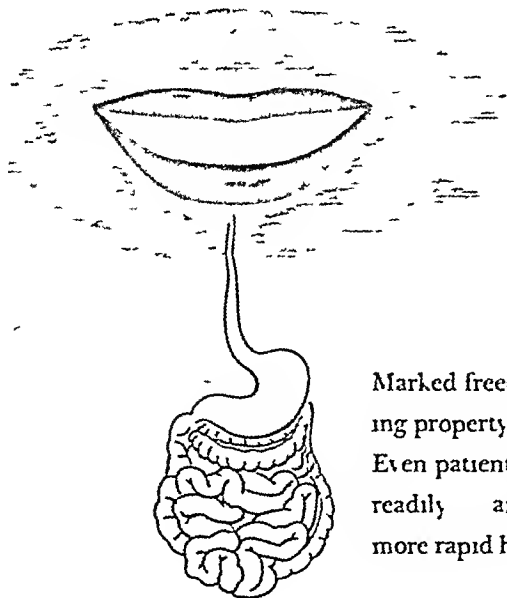
supplies the needed male sex hormone for maintenance of normal physical and emotional balance in the male climacteric and in other androgen deficiency states.

When normal sexual growth is retarded in the formative years, proper development of the male genitalia and secondary sex characteristics may be achieved with ORETON

PACKAGING ORETON (testosterone propionate in oil) for intramuscular injection. Ampules of 1 cc. containing 5, 10, 25 mg. Boxes of 3, 6 and 50 ampules.



Schering CORPORATION LIMITED
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MONTREAL, QUE.



Agreeable Iron...

Marked freedom from gastro-intestinal distress is an outstanding property of Fergon—Stearns stabilized ferrous gluconate. Even patients intolerant to other forms of iron accept Fergon readily and most patients show more efficient utilization, more rapid hemoglobin gain.

Fergon

SIMPLE PREPARED CURE

For Hypochromic Anemias

THERAPEUTIC APPRAISAL *Better Tolerated*—Fergon is only slightly ionized, therefore virtually non-irritating even when administered before meals. *Better Absorbed*—Fergon is soluble throughout the entire pH range of the gastro-intestinal tract. *Better Utilized*—as shown by comparative clinical studies.*

INDICATED in the treatment and prevention of hypochromic anemias,



especially in patients intolerant to other forms of iron.

AVERAGE DOSE for adults is 3 to 6 tablets (5 gr.) or 4 to 8 teaspoonful of elixir daily; for children, 1 to 4 tablets or 1 to 4 teaspoonful of elixir daily.

SUPPLIED as 5% elixir, bottles of 16 fl. oz. 5 gr. tablets, bottles of 100 and 1000.

A trial supply will gladly be sent on request.

Frederick Stearns & Company

of Canada, Ltd.

WINDSOR • ONTARIO

NEW YORK

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SYDNEY, AUSTRALIA

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*Remickoff, P., and Goebel, W. F. J. Clin. Investigation 16:5-7 1937

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LIFE WITH "JUNIOR" by *Elsie*, the Borden Cow



It's not surprising that so many physicians prescribe Borden's Evaporated Milk for baby formulas

Borden's Evaporated Milk passes the most rigid tests for quality, purity and uniformity. The highest standards are maintained by inspection during

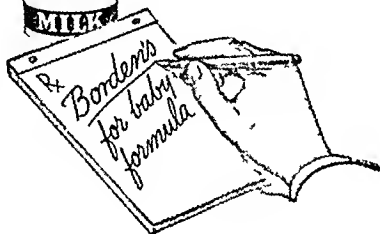
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Borden's Evaporated Milk is concentrated from the finest whole milk and is sterilized and homogenized

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Natural content of vitamin D
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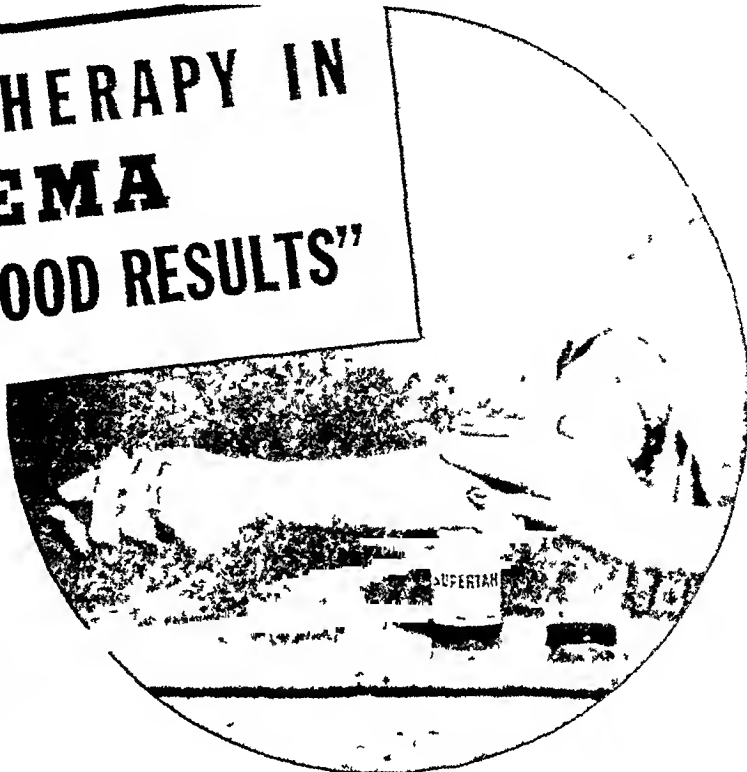


At your request we will be pleased to send formula suggestions in card form — also prescription pads

THE BORDEN COMPANY LIMITED

Spadina Crescent, Toronto 4

SUPERTAH THERAPY IN ECZEMA yields 88.1% "GOOD RESULTS"



Almost 9 out of 10 physicians prescribing SUPERTAH (Nason's white, non-staining, nearly odorless concentrate of black coal tar) for Eczema report "GOOD RESULTS" This was determined by a cross-section survey of United States doctors made for us by an independent research agency

There are good *reasons-why* SUPERTAH is preferred to the black tar

(1) Clinical findings* show that clean white SUPERTAH retains the beneficial therapeutic effects of black crude tar, free from any objectionable features

(2) SUPERTAH does not irritate even the delicate skin of an infant, nor cause pustulations or other dermatitis as crude tar sometimes does

(3) Most important, SUPERTAH *is used* by the patient because it is free of the objectionable odor the repulsive black color the linen and clothing-staining disadvantages of crude tar preparations, which, all too often, prompt the patient to skip their use, to leave them unopened on the bathroom shelf SUPERTAH *is used, and used as you direct*

*SWARTZ & REILLY 'Dagnosis and Treatment of Skin Diseases' p 66

SUPERTAH

(NASON S)



TAILBY-NASON COMPANY, Boston, Mass

Kendall Square Station

VI-MAGNA*

Lederle



Multivitamin deficiency is no respecter of persons. It afflicts the *wealthy as well as the poor*, the more as well as the less intelligent, the city dweller or the farmer. Its geographical distribution is universal, and its age distribution is from infancy to old age. A rule of thumb applicable to the average clinician's practice might well be phrased, "every patient is potentially a case of vitamin deficiency until proven otherwise." VI MAGNA—in its various forms—has been used with steadily increasing frequency by the medical profession for the prevention of multivitamin deficiency.

VI MAGNA* LENTABS—
Bottles of 50, 100 and 1000 LENTABS

VI MAGNA CLIPSULES—
Bottles of 100 CLIPSULES

LEDERLE LABORATORIES DIVISION
NORTH AMERICAN CYANAMID LIMITED
1396 St. Catherine Street, West

• FORMULAE •

VI-MAGNA LENTABS* LEDERLE

For adults and children

Vitamin A	5 000 U.S.P. Units
Vitamin D (Viosterol)	500 U.S.P. Units
Ascorbic Acid (C)	30 mg
Thiamine HCl (B ₁)	3 mg
Riboflavin (B ₂)	2 mg
Niacinamide	20 mg
Calcium Pantothenate	1 mg
Pyridoxine HCl (B ₆)	0.2 mg
With excipients, flavoring and artificial coloring	

VI MAGNA CLIPSULES* LEDERLE

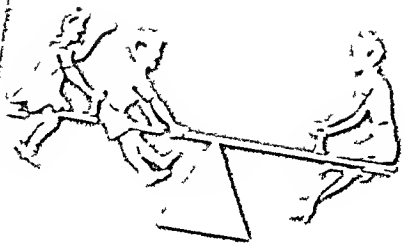
For infants and young children

Vitamin A	3 000 U.S.P. Units
Vitamin D (Viosterol)	800 U.S.P. Units
Thiamine HCl (B ₁)	0.4 mg
Riboflavin (B ₂)	0.6 mg
Niacinamide	4.0 mg
Ascorbic Acid (C)	

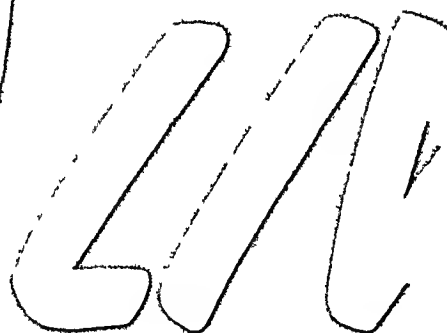
*Reg. U.S. Pat. Off.

medicine discussed by eminent me-
t coast to coast over the American

profession in
Broadcasting Company network



100%



FORMULA

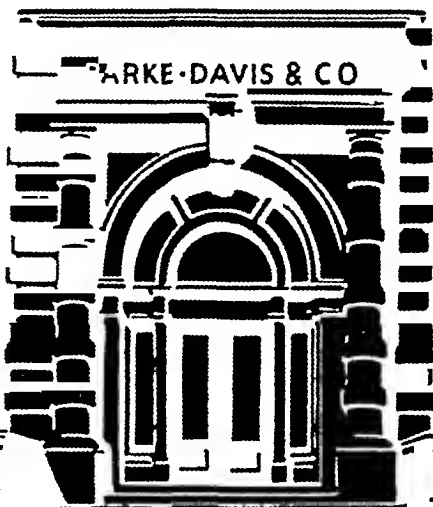
Ingredient	Per 100 mg	Per 100 mg
Vitamin A	3 mg	0.10 mg
Vitamin B	3 mg	0.10 mg
Vitamin C	20 mg	0.10 mg
Vitamin D	10 mg	0.10 mg
Vitamin E	2 mg	0.10 mg
Vitamin K	2 mg	0.10 mg
Vitamin P	2 mg	0.10 mg
Vitamin Q	2 mg	0.10 mg
Vitamin R	2 mg	0.10 mg
Vitamin S	2 mg	0.10 mg
Vitamin T	2 mg	0.10 mg
Vitamin U	2 mg	0.10 mg
Vitamin V	2 mg	0.10 mg
Vitamin W	2 mg	0.10 mg
Vitamin X	2 mg	0.10 mg
Vitamin Y	2 mg	0.10 mg
Vitamin Z	2 mg	0.10 mg
Vitamin AA	2 mg	0.10 mg
Vitamin BB	2 mg	0.10 mg
Vitamin CC	2 mg	0.10 mg
Vitamin DD	2 mg	0.10 mg
Vitamin EE	2 mg	0.10 mg
Vitamin FF	2 mg	0.10 mg
Vitamin GG	2 mg	0.10 mg
Vitamin HH	2 mg	0.10 mg
Vitamin II	2 mg	0.10 mg
Vitamin JJ	2 mg	0.10 mg
Vitamin KK	2 mg	0.10 mg
Vitamin LL	2 mg	0.10 mg
Vitamin MM	2 mg	0.10 mg
Vitamin NN	2 mg	0.10 mg
Vitamin OO	2 mg	0.10 mg
Vitamin PP	2 mg	0.10 mg
Vitamin QQ	2 mg	0.10 mg
Vitamin RR	2 mg	0.10 mg
Vitamin SS	2 mg	0.10 mg
Vitamin TT	2 mg	0.10 mg
Vitamin UU	2 mg	0.10 mg
Vitamin VV	2 mg	0.10 mg
Vitamin WW	2 mg	0.10 mg
Vitamin XX	2 mg	0.10 mg
Vitamin YY	2 mg	0.10 mg
Vitamin ZZ	2 mg	0.10 mg

100% Pure Vitamin
100% Pure Vitamin
100% Pure Vitamin

SPECIAL NOTE

For your Special Note
CAPSULES
Responsible for

RESEARCH IS THE OPEN SESAME TO PROGRESS



The secrets behind this door require a
diligence, perseverance,
Here are developed
in the laboratory
in the hands of brains
are engaged in constant study still

Developed in this never-ending field
research workers of Parker-Davis & Co.

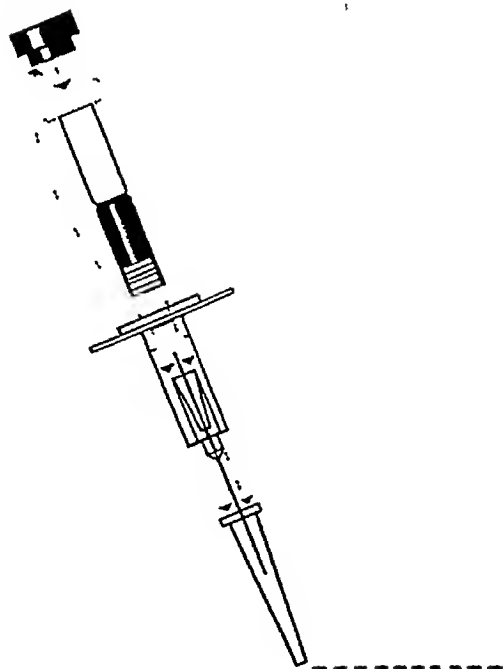
do more than create new forms
they have
MEDICAMENTA VERA

of professional trust



PARKER-DAVIS & COMPANY, LTD. • WALKERVILLE, ONTARIO

As easy as...



Practically as simple as that is the preparation for an injection of Abbott's Romansky formula of penicillin calcium in oil and wax when you use a new Sterile Disposable Cartridge Syringe. And the reason? No further sterilization of needle and syringe. No bother of drying, with its danger of complications from remaining traces of water. No difficulty of drawing the suspension into a syringe and no wastage. And, what's more, no need to worry about cleaning the needle and syringe afterwards. *Just throw them away.* Each set is complete, compact, easy to carry and ready for use. It consists of a disposable plastic syringe with an affixed standard 20-gauge, $1\frac{1}{2}$ -inch stainless steel needle and a glass cartridge-plunger containing a 1-cc dose of 300,000 units of penicillin suspended in peanut oil and beeswax. Occasionally supply does not meet demand, but we're speeding up production all the time. ABBOTT LABORATORIES, LIMITED, MONTREAL.

Abbott's
Penicillin in Oil and Wax
(ROMANSKY FORMULA)

with a disposable cartridge syringe

Star of hope in petit mal...



For thousands of children laboring under the social and educational handicaps imposed by petit mal, Tridione, a product of Abbott research, offers new hope. In one series of cases, for example, Tridione was administered to a group of 50 patients suffering from petit mal, myoclonic or akinetic seizures which had not responded to other medication. In a period of days to weeks, the seizures ceased in 28 percent of the cases, were reduced to less than one-fourth of the usual number in 52 percent, and were little affected in 20 percent. In several instances, the seizures once stopped did not return when medication was discontinued. Tridione has also been shown to have a beneficial effect in the control of a certain proportion of psychomotor cases. Tridione is supplied in 0.3-Gm capsules, bottles of 100. Literature on request. ABBOTT LABORATORIES, LIMITED, MONTREAL.

Tridione, Abbott

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(3,3,5-TRIMETHYLOXAZOLIDINE 2,4-DIONE, ABBOTT)

Richards, R. K. and Perlstein, M. A. (1945) Tridione, A New Experimental Drug for the Treatment of Convulsive and Related Disorders, *Proc. Chicago Neurological Soc.* Jan. 9, and (1946), *Arch. Neurol. and Psychiatry*, 55:164, February.
Lennox, W. G. (1945), *Petit Mal Epilepsies: Their Treatment with Tridione*, *J. Amer. Med. Assn.* 129:1069, December, 15.
DeJong, R. N. (1946) Effect of Tridione in the Control of Psychomotor Attacks, *J. Amer. Med. Assn.*, 130:565, March 2.

The Canadian Medical Association Journal

Vol 55

TORONTO, OCTOBER, 1946

No 1

The Fifth Blackader Lecture

on

THE EFFECT OF ANTE NATAL CONDITIONS ON THE NEW-BORN CHILD*

By Sir Leonard G. Parsons, M.D.,
F.R.C.P., F.R.C.O.G.

*Professor of Paediatrics in the
University of Birmingham, England*

IN the closing years of Queen Victoria's reign two events occurred, the one in Edinburgh and the other in Boston, Mass., which revolutionized the practice of obstetric medicine and might also have revolutionized paediatric practice if only paediatricians had been wise in their day and generation.

In 1900 Ballantyne of Edinburgh published two lectures on "Ante-natal diagnosis" which he defined as "the discovery of normal pregnancy and of plural pregnancy, of fetal death, of diseases and monstrosities of the fetus, of hydramnios and of morbid conditions of the placenta."

In 1901, the Instructive Nursing Association of Boston commenced to pay visits to some of the expectant mothers who applied to be out-patients at the Lying-In Hospital. These events, although not the first examples of ante-natal care, were the starting point for the present system of ante-natal clinics and for the recognition of the important part which ante-natal care can play in the prevention of abnormal labour and in the reduction of maternal mortality. Ballantyne was, however, particularly concerned with the care of the unborn child, because in 1901 he wrote of attempts to "cure before birth the diseases and disorders of the fetus" and made no reference to the interests of the mother, but in an address delivered shortly before his death in 1923, these were his paramount concern and the only reference to the value of ante-

natal care to the fetus was the statement that it would reduce the still birth rate.

The reason for this change of viewpoint is a mystery and another mystery is why paediatricians did not take up and develop his suggestions. One explanation of the latter may have been the lack of interest in infants displayed by many British paediatricians in the early years of this century. When I started my paediatric career, except for certain arresting conditions in infants such as scurvy and pyloric stenosis, interest was centred on the older child, possibly because nearly all children's physicians also practised adult medicine. Another probable reason for this indifference was the fact that the obstetrician took charge of the new-born baby. As time went on the infant received more study and in some maternity hospitals the care of the new-born child was handed over to the paediatrician and today the care of the neonate and attempts to lower neonatal mortality are important aspects of British paediatrics. This trend has naturally led to a study of the premature infant and has at last made some of us wonder whether by the care of the mother prematurity and fetal disease could be prevented and the birth of better and healthier babies ensured.

I have ventured to call this aspect of ante-natal care "ante-natal paediatrics", and I feel justified in asserting that in future the paediatrician and the general practitioner must be concerned with the health of the baby from the moment of conception and, indeed, even before that occurrence when there is a possibility of genetic disorders arising. One of the earliest enquiries about the effect of ante-natal conditions on the new-born with which I am familiar was the question put to our Lord by his disciples, "Master who did sin in this man or his parents that he was born blind?" You remember the reply, "Neither hath this man sinned nor his parents, but that the works of God might be made manifest in him." Is it fanciful to think that therein lies an explana-

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tion of the existence of disease and that the research worker is a fellow worker with God?

From the time of conception two forces, heredity and environment—nature and nurture—act upon the cell as a unit and upon the fetus as a whole. A knowledge of their interplay is essential to an understanding of the laws of human inheritance, the nature of disease, and the circumstances which may modify or prevent it. Every characteristic of the developing fetus and new-born child is the result of interaction between the genes and their environment.

Congenital hæmolytic disease furnishes an excellent example of this interplay since the development of Rh antibodies in the mother is due to genetic causes, whereas their transference to the fetus alters its environment. Nurture rather than nature is responsible for the well-being and vigour of the child, for the development of certain diseases and its immunity to others, whereas all genetic diseases and deformities are due to nature. Certain malformations, however, may be caused either by defective genes or defective nurture, in other words, "a bad egg in a good environment or a good egg in a bad environment" may produce the same abnormality. Intellectual and other resemblances, even similarity in disease, occur more frequently in identical than in non-identical twins, and are genetic in origin since with one exception, providing that the cords and placenta of non-identical twins are approximately the same size, the environmental conditions for both varieties of twins must be the same. The exception is the occurrence of congenital hæmolytic disease in one of non-identical twins, the twins being of different genotypes whereas the maternal antibodies were of one type only (Stratton, Langley and Lester).

The Calvinistic doctrine of predestination is now demoded in regard to things of the spirit but continues to hold firm sway in genetics and although it is true that some adverse genetic effects can be modified by a good environment there are others on which environment has no effect. Hence some babies are foreordained to suffer, and perhaps to die, at or shortly after birth. It is interesting to speculate on the contribution that these children might have made to the community, and it may well be that in them we have lost—to quote from a

poem that has become part of Canadian history

"Hands that the rod of empire might have swayed
Or waked to ecstasy the living lyre

But knowledge to their eyes her ample page
Rich with the spoils of time, did ne'er unroll"

In the present state of our knowledge such a state of affairs can only be prevented by careful mating, or by taking refuge in a negation—the avoidance of pregnancy.

Any attempt to assess the relative importance of environment and heredity in the development of character and of the spiritual virtues partakes more of an exercise in philosophy than of one in experimental medicine. Ante-natal environment can, however, have little influence on character since "sweet thoughts are no more soluble in maternal blood plasma nor are more able to pass a semi-permeable membrane of living protoplasm than are sour moods or tragic emotions" (Corner). Heredity plays a somewhat greater part but, in my opinion, post-natal environment, particularly in the form of a happy home and family life, is by far the most important factor and the comparatively great temperamental differences which may be found in monozygotic twins (Dahlberg) is strong evidence in support of this view.

Concluding a brilliant essay on "The interplay of nature and nurture", my colleague, Laneelot Hogben says "In so far as a balance sheet of nature and nurture has any intelligible significance it does not entitle us to set limits to changes which might be brought about by regulating the environment." In ante-natal paediatrics, environment is, in my opinion, more important than nature and it certainly is much more under our control, its effect on the fetus can be discussed under three heads: (1) the diet of the mother, (2) her nutritional state, and (3) the condition of her health. These factors produce different results in different periods of pregnancy, chiefly malformations in the first three months and in the last three months fetal immaturity and fetal disease.

I MATERNAL DIET

During the war years there was a striking fall in the still-birth rate in Great Britain. In 1930 in England and Wales, the rate was 41 per 1,000 total births, in 1939 it was 38, but in 1944 and 1945 it had dropped to 28, in Scotland

the figures were 12 in 1939 and 22 in 1941 and in neither country did the rate rise in any of the war years. Baird has shown that in Aberdeen this fall was due to a reduction in the categories "cause unknown", "trauma" and "toxemia" but not to any fall in deaths due to fetal deformity. The risk of still birth is ten times greater in a premature than in a full term child and both prematurity and still births are highest in the lowest social classes. The neonatal death rate in Great Britain rose in 1940 and 1941, but since then has fallen to a lower level than in 1939. This diminution has been due to fewer deaths from prematurity, isphyxia, trauma and congenital debility, the death rate from infection being rather higher than the pre war figures. The rise in neonatal deaths in 1940 and 1941 was more marked in large cities like Glasgow and Birmingham in the latter of which the rise continued to 1942 and was due to "infections",—probably the result of war conditions, evacuation bombing, shelter life, etc.—and also to deaths from direct enemy action. Neonatal deaths from prematurity and congenital debility are, like stillbirths, highest in the lowest social classes. This is the consequence either of an inherited inferiority in reproductive capacity,—for which there is no evidence—or of the inferior general health and nutrition of expectant mothers and of the unfavourable environmental conditions in which they live. It is improbable that the diminution in neonatal deaths in the later war years was the result of better nursing and doctoring, if only for the reason that nurses and doctors were in short supply and over-worked, furthermore, except for the introduction of penicillin and new sulfonamide preparations, there was not any important therapeutic advance in this field. The value of these drugs is to combat infection but despite them the incidence of infections actually increased. Therefore since the fall in deaths has been greatest in the lower social classes it seems logical to conclude that this is due to the increase in wages, the abolition of unemployment and the improved nutrition of the mothers.

There is considerable evidence that as a result of rationing and better distribution of food the diet of a large part of the population has improved during the war years. In 1940 and 1941 there was a sharp fall in food supplies particularly in meat, fats, sugar and fruits but from 1942 until the termination of lend lease and

from the Department of Health and the Public Health Service. The Department of Health and the Public Health Service are now working on a plan to assess the effect of the present restricted diet on the health of the population—the improvement is probably the result of the rationing—which from April 1942 to February 1943 was made from the rationing of the ration of 50% and the ration of consumption of the ration together with additional ration of the ration of vitamins A, B, C and D for expectant mothers and for children. Prior to the war many mothers could not afford these supplements or were ignorant of their value and even now it is estimated that less than 50% of the mothers take away from the antenatal centre the vitamins provided for them. Before the war even the poorer people had a wider choice of foods than they have now but exercised it unwisely now although the choice is limited it is confined to good food of which hunger compels them to partake. Moreover the reduction in sugar has improved the diet because less vitamin B is required for its oxidation (Magee).

Malformations, whether genetic or nutritional in origin commence early in pregnancy, the fifth to the ninth weeks being the critical period in the development of the lens, teeth, palate and septa of the heart. The work of Warkany and his colleagues at Cincinnati must be well known to you. They have shown that by restricting the diet of rats in the early stages of pregnancy the young showed deformities such as shortening of the mandible, cleft palate, shortening and distortion of the limbs, syndactyly, fusion of the ribs, some of which are identical with those produced by genetic conditions. Warkany has also shown that the young of rats fed on a vitamin A deficient diet in early pregnancy show congenital defects of the eyes and Hulse found the same in pigs. Moreover, none of these defects can be prevented by giving a normal diet in the latter part of pregnancy. Similar experiments cannot be carried out deliberately in the human being, although under famine conditions they may become inevitable. We know that the number of deaths from deformities in new born babies has neither increased nor perceptibly diminished in Britain during the war years but there is no

information as to whether there has been any diminution in the number of those congenital deformities which are compatible with sustained life

The effect of maternal diet and nutrition on the general development of the fetus in the earlier part of pregnancy compared with that in the last third of pregnancy is well shown in a series of interesting animal experiments by Wallace. These experiments, which were designed to test the effect on the offspring of the diet in general but not of any particular constituent, showed that the weights of the embryos were the same whether ewes during the first two-thirds of pregnancy were fed on a poor diet on which they lost considerable weight or on a liberal one on which their weight showed marked increase. During the last third of pregnancy, a liberal diet given to those previously on a poor diet produced a large gain in weight by the ewes, and their lambs were almost identical in size with those fed on the liberal diet throughout, whereas the lambs of those fed on the liberal diet for the first two-thirds of pregnancy and on a poor diet in the last third on which they lost weight were only slightly larger than those fed on the poor diet throughout pregnancy. Moreover, all the ewes who were well fed during this period developed large udders, while the udders of those which were poorly fed remained small. These results clearly indicate that the weight of the fetus and the preparation for lactation depend upon the nutrition of the mother in the last third of pregnancy.

In any attempt to apply these results to pregnant women, two points should be borne in mind. First, although, in the absence of obvious oedema, the weight of a baby can be regarded as important evidence of its state of nutrition, this is not the case with its mother, because of the effect of water retention, especially in toxæmia of pregnancy, therefore, any enquiry must be confined to women who show only a slight increase in weight. Secondly, a baby is born in a much less advanced state of development than a lamb.

The normal baby starts life with a stock of vitamins, hormones, metals, etc., sufficient for its immediate needs. After birth these stores begin to diminish—a negative phase—and continue to diminish until the child is either able to obtain them from its diet or to manufacture them. If

the baby is one of twins, or is born prematurely, or its mother has been inadequately nourished or has suffered from an illness or a conditioned deficiency during pregnancy, the baby's stores at birth may be insufficient and its diet may not be able to bring the levels up to normal. Morbid conditions such as hæmorrhagic disease of the new-born, nutritional anæmia, tetany, rickets, scurvy, cretinism may then develop, conditions which are even more likely to occur if the baby's diet is also defective. The fetal reserves are mainly built up during the last third of pregnancy in which time two-thirds of the calcium phosphate, three-quarters of the protein and four-fifths of the iron are laid down. Indirect evidence of the importance of storage during this time is provided by the facts that premature infants develop an iron deficiency anæmia at an earlier age and suffer more frequently from rickets than full term babies, furthermore, Ebbs, Tisdall and Scott found that rickets, tetany and anæmia were more frequent in babies under six months of age whose mothers, during the last three months of pregnancy, partook of a "poor" diet than in those having a "good" or a "poor" diet which was supplemented to a "good" diet.

II NUTRITIONAL STATE OF MOTHER

If the maternal diet is deficient the fetus has the prior claim to the available nutrients but if these deficiencies are too great the mother's self-sacrifice may be unavailing and the baby may either be born with manifest deficiency symptoms or develop them much earlier than the usual time of incidence. Herein lies the explanation of fetal rickets and of the majority of examples of tetany, polyneuritis and keratomalacia in the new-born, furthermore, the presence of a deficiency disease in the new-born baby almost invariably means that the mother herself suffers from that disease. Iron may be an exception to this rule of fetal priority, sometimes in experimental animals and also in human beings the mother may conserve her store of iron at the expense of her fetus which is then either born anæmic or develops a nutritional anæmia at an abnormally early age (Parsons, Parsons and Hickmans). Clearly, therefore, the mother's diet during pregnancy should be more than adequate and contain full supplies of vitamins, phosphorus, calcium, and iron and every effort should also be made to prevent the premature birth of the fetus.

The mother not only transmits immunity to the fetus but also certain immune bodies so that although a newborn is prone to many infections the new-born baby has a degree of protection to certain infectious diseases particularly diphtheria, measles and chicken pox. In this respect babies differ from lambs and calves which develop an immunity to lamb scour and calf dysentery, respectively, only after the first parturition of colostrum. This difference in mechanism is due to variations in placental structure: in women the placenta is thin the blood actually bathing the chorionic villi and thus rendering transference easy whereas in the cow it is thick. The titre of diphtheria antitoxin is as high in the blood of the new-born baby as in its mother and is not increased by taking colostrum. On the other hand, Rh antibodies may not only be found in the blood of the baby at birth but also in high titre in the colostrum and sometimes, although in much lower titre, in breast milk, suggesting that some antibodies are transferred by human colostrum and milk, indeed, this is the only explanation of the accepted view that breast feeding confers a degree of immunity on young infants.

Human colostrum is richer in vitamin A protein and globulin than breast milk, but this does not prevent these bodies showing the usually negative phase after birth. The amount of vitamin A in colostrum is high on the first day and rises to a maximum in the third day of lactation, it then falls rapidly to reach on the 9th and 10th days the concentration in mature milk (Lescher *et al*). On the other hand, the vitamin A content of the baby at birth is extremely small and of the premature baby still smaller when compared with that found a few weeks later. It is therefore a logical deduction that although vitamin A can be transferred via the placenta it is chiefly transmitted to the baby through the colostrum and milk. The serum globulin of the new-born baby falls to the 4th week then remains unchanged until 4 months after which it rises but does not reach the adult level until the 4th year. This level is higher than that of premature babies (Hickmans). The amount of globulin in the serum is important since antibodies are molecules of globulin specifically modified during synthesis by an antigen and which from their movement in an electrical field are called gamma globulins. In the badly nourished or immature fetus the

concentration of these bodies is low and the result is that the newborn is more susceptible to infection. The newborn baby is also more susceptible to infection than the adult because of the immature state of the immune system. The newborn baby is also more susceptible to infection than the adult because of the immature state of the immune system. The newborn baby is also more susceptible to infection than the adult because of the immature state of the immune system.

III THE HEALTH OF THE MOTHER

The state of the mother's health may not only affect the nurture of her fetus but may be the cause of actual fetal disease. The effect of toxemia of pregnancy in producing premature and still births is well known and despite certain adverse criticisms, the investigations carried out in Toronto, South Wales, London, Oslo and Aberdeen strongly support the view that the diet and nutritional state of the mother in the latter third of pregnancy affect the incidence of toxemia, premature and still births and the health of the new-born child. The effects of other maternal conditions, for instance diabetes, are however less commonly appreciated. According to Miller of New Haven and his colleagues, fetal or neonatal death occurs in about 30% of these pregnancies even when the disease is controlled by insulin but Lawrence and Oakley, in London found the mortality varied from 23% in those who had complete supervision to 70% in those who had none. Another outstanding finding in diabetes is the large size of the fetus which may weigh over 12 lb. so that Caesarian section at the 36th to 38th week offers more chance of a live baby than spontaneous delivery at term. Lawrence and Oakley thought that this gigantism was due to hyperglycemia and depended on the degree of diabetic control, but Miller and his colleagues found that gigantism, neonatal and fetal death with characteristic findings at autopsy sometimes occurred five years or more before the mother shows any evidence of diabetes, observations which we have been able to confirm and which shed light on the etiology of diabetes but rule out the theory that hyperglycemia is the cause of the oversized fetus. Many suggestions have been made as to why the offspring of the

diabetic and the pre diabetic mother behave in this way, but none of them has so far received general acceptance. Recently I was told that Dr Piusilla White of Boston had been able, by remedying the disordered hormonal pattern present in some diabetic mothers to reduce the fetal and neonatal mortality and the size of the fetus.

Rubella and fetal deformities—Recently great interest has been aroused in the possible association of rubella in the mother and malformations in the fetus. Most of the evidence for this association comes from Australia where Gregg in 1941 first drew attention to it. His interest was aroused by the fact that in the first half of that year he saw a large number of babies with a somewhat unusual form of congenital cataract and on questioning their mothers found that they had nearly all suffered from German measles in the early months of pregnancy, i.e., in the period of malformation. The German measles epidemic of 1940 had been a severe one and of a total of 78 children with congenital cataract, 46 of whom also had congenital heart disease, 68 of their mothers were found to have contracted German measles early in pregnancy and between December 1939 and January 1941. Many of these children were also small, badly nourished and bad feeders. These results were confirmed for South Australia by Swan and his colleagues who also found dental defects, deaf mutism and mental retardation amongst their patients. Table I shows the results of their

TABLE I

Mothers	Disease during pregnancy	Infants with defects
57	Rubella	40
1	Rubella and measles	1
2	? Rubella and ? measles	0
1	Rubella and mumps	0
7	Measles	0
1	Mumps	1
1	"Influenza"	1
4	None	4
74		47

investigations. Welch has collected lists of the number of children born deaf in each of the years 1931 to 1941 in New South Wales, in only one year did the number reach double figures, but in 1938 it was 47, and 34 of their mothers had rubella during the first four months of pregnancy. Cases have also been described in America and in England. Many pediatricians have seen isolated cases but the largest number

reported in England were obtained by Martin (1945) as the result of a questionnaire to the mothers of 102 deaf children born in 1940-1941, i.e., in the year following a widespread epidemic of rubella. In 8 instances the deafness was hereditary and in 15 caused by meningitis and of the remaining 79 children the mothers of 36 had rubella during the first four months of pregnancy and 6 other mothers probably suffered from the disease. In a letter which I received from Gregg (dated May 24, 1946) he stated that the number of instances of which he has details in which congenital defects followed rubella has now reached 206. 130 of these cases were collected in 1944 and the defects observed were distributed as follows:

TABLE II

Deaf mutism	85
Deaf mutism and heart disease	17
Heart disease	5
Eye defects	6
Eye defects and heart disease	8
Deaf mutism, eye defects and heart disease	8
Deaf mutism and eye defects	1
	130

The following table (Table III) shows the number of cases so far reported in Australia, America and England and is as accurate as I can make it. In some tables published some cases have been counted more than once.

TABLE III

Country		Number of babies with congenital defects where mothers had rubella during pregnancy
Australia	Gregg	206
	Swan et al	75
	Welch	34
America	Riese	3
	Erickson	11
	Rones	3
	Adams	2
	Greenhal	2
England	Alburgh	9
	Martin	36
	Hope Simpson	3
		385

Weston Hurst, whom Swan consulted, thought that these deformities were due to the effect of the virus in vascular tissue, whereas Corner suggests that they are the result either of a disturbance of the "organizer" or of injury to the "reactant tissue". As a result of their investigations Swan and his colleagues came to the conclusion that when a mother developed rubella in the first two months of pregnancy the

absence of her future birth to a couple for defective children in the region of 100 per cent if she contracts the disease in the third month about 60 per cent. If there are real grounds for this, it could appear that there are more than one obviously legal procedure for 'maintaining' pregnancy, but before the connection can be accepted as cause and effect there are certain criteria which can only be answered satisfactorily by a large scale investigation. One criterion is that in the absence of controls the results are not statistically significant. These controls should be (a) comparisons with other infectious diseases, particularly with other virus diseases such as measles, mumps, etc. to a small extent this criticism has been met because 8 of the mothers in Swan's series had other infectious diseases during pregnancy and only one child showed congenital deformities. (b) comparison with a series of pregnancies in which there were no infectious diseases, and (c) a series of mothers in whom infectious disease occurred and the effects on their babies as subsequently observed and not as has usually been done, an enquiry made retrospectively into pregnancy conditions when a congenitally deformed child has been encountered. The difficulties of such investigations are shown by the experience of Pax and Borten of Milwaukee. This is a city of over half a million inhabitants and in the years 1912-13-44, 22,226 cases of rubella occurred but of these only 581 were married women. Of this number 151 patients were investigated and the number of babies born to them was only 11, none of them had any congenital abnormalities. There therefore seems good grounds for the suggestion that to obtain a really good statistical result in England and Wales a survey of all married women would be necessary.

Another criticism is that the disease was a new infection and not true rubella but from my review of the literature I think this is probably not a valid criticism. A further criticism is that such a mild disease as rubella is unlikely to cause such catastrophic changes in the fetus to which the reply is made that in mammals embryonic cells are more susceptible to virus infections than adult tissues and it is known that the placenta is permeable to a number of viruses. This view is supported by the fact that for developmental reasons the deformities concerned must have originated in the fifth to the ninth week of pregnancy, i.e., in the more embryonic state of the fetus and

1. 1994年12月1日，某公司（以下简称A公司）与某银行（以下简称B银行）签订了一份借款合同，约定A公司向B银行借款人民币100万元，期限自1994年12月1日起至1995年12月31日止，利率按中国人民银行规定的同期同档次贷款利率执行。

It is interesting to note that the name of a Mississippi Negro, Dr. A. A. S. Jones, has been used to describe a connection with Germany. He has been called the "the devil head" of the Negro "Gives the white and pig count" "presents" male the harp. "We and men" according to Colquhoun, an opponent of Shakespearean pediatrics, probably refers to entered or a common scar. A come (Ventril) has said recently that "some have done nothing about Flibbertigibbet unless on count for a suggestion that one of his other names is 'Get in meekles'.

It seems obvious that the association between maternal rubella and congenital defects had never been noted before 1940. From 1927 to 1937 Australia was free from epidemics of rubella and therefore a large number of Australian young women possessed no immunity to the disease. The 1957 epidemic had not died out in remote districts when the virus broke out and the mass movement of young people which followed fanned the embers of the epidemic into a blaze which swept over the whole country (Scholes). The resulting high incidence of the disease in pregnant women followed by an epidemic of defects made recognition unavoidable according to Hurst and completely convinced him that rubella during the first three months of pregnancy could lead to congenital defects.

The Australian investigators suggested that pooled or adult serum should be used to combat immunity upon the expectant mother, but stocks are not available in my country, or in Great Britain are stocks of human globulin available for this purpose still less. More potent preparations—the gamma globulin fraction of ruble convalescent serum. It increases the period of passive immunity to a hundred and the infection could be expected to be reported there is less the infection. For these malformations arise so early in pregnancy

that the woman may not know that she is pregnant. It is clear that this problem of German measles urgently requires extensive study and in the meantime it behooves all women in the early weeks of pregnancy to avoid exposure to the disease.

Congenital hæmolytic disease—We have seen that during the later months of pregnancy the human placenta allows the passage of antibodies from the mother to the fetus, a fact that is made use of in the prophylaxis of measles by the administration of placental extract. Rh antibodies are transferred in this way and may produce severe results in or even the death of the fetus, indeed, according to Haldane, congenital hæmolytic disease is responsible for more deaths than any other inherited disease or possibly than all of them put together. Its intra-uterine manifestations are slightest and perhaps non-existent in hæmolytic anæmia of the new-born, which may not develop until 2 or 3 days after birth when sufficient X protein becomes available. They are at their maximum in hydrops fœtalis with icterus gravis a close second.

The jaundice of icterus gravis is not due to biliary stasis from excessive hæmolysis but to liver damage as is shown by the fact that cirrhosis of the liver sometimes follows icterus gravis just as it follows infective hepatitis, and by the cholesterol partition in the blood serum (Rothe-Meyer and Hekmans). We have never been able to confirm the finding of cirrhosis of the liver in jaundiced still-born babies, indeed, cirrhosis probably only becomes obvious when the child is some months old and bears the same relationship to liver damage that extra-pyramidal rigidity and other cerebral manifestations do to kernicterus.

The existence of kernicterus raises interesting questions as to whether it is due to excessive hæmolysis, to fixation of antibody in nerve cells, or to hepatic disease. We have never found any parallelism between the degree of hæmolysis on the one hand and the severity of the jaundice and the presence of kernicterus on the other. Again, in our experience the incidence of kernicterus, as judged by post-mortem records and nervous sequelæ in later childhood, has, contrary to Werner's experience, not been diminished by transfusions with Rh negative blood since these only compensate for and limit hæmolysis. These

two observations show that kernicterus is not due to hæmolysis and that the adverse effects of Rh antibodies are not limited to their action on the red cell. Furthermore, we have seen jaundice and kernicterus and indeed all the symptoms of hæmolytic disease occur in the course of sepsis neonatorum, again, a post-mortem examination on a baby who was not jaundiced revealed miliary hæmorrhagic necroses of the liver and also necrotic foci in the corpus striatum which showed the same microscopical characteristics as those of kernicterus except that the foci were not bile stained. Finally, neither cirrhosis nor kernicterus has ever been reported in hæmolytic disease of the new-born, in which condition there is only the slightest trace of jaundice. These observations point overwhelmingly to the conclusion that kernicterus only occurs when there is severe liver damage and that as a result of this damage necrotic changes take place in the brain and that the necrosed brain cells then become stained with bile. In the majority of cases of kernicterus the staining of the dead brain cells probably occurs shortly after birth, since the jaundice frequently does not become severe until 24 hours or so after birth. In actual fact we have found post-mortem evidence of kernicterus when death occurred on the second day. The after effects of this damage to the liver and brain are cirrhosis of the liver, extra pyramidal rigidity, athetosis and mental deficiency.

Another rare and interesting sequel of icterus gravis is green teeth. The temporary dentition only is affected and the coloration is usually limited to the incisors, the enamel of which begins to be formed in the 6th and 9th week of pregnancy and is completed after birth at the 4th month. There is no evidence of the premature death of the enamel cells, and the condition is probably related to the intensity and persistence of the jaundice and with the staining of bone with bile of which I have observed an example in icterus gravis.

From what has been said it is clear that although these grave complications are initiated before they may increase after birth. It is impossible to say why they occur in some babies suffering from icterus gravis and not in others, nor can we tell during the neonatal period whether or not the baby is likely later to show evidence of any of them, although kernicterus

man greathearted the soul of professional ethics, loyal to his friends and charitable to all", and one who was a great pioneer in pædiatrics. The sight of these wonderful mountain peaks reminds me of those pioneers in other fields who laid the foundations of our Empire and whose spirit has been so vividly described by Kipling in his poem *The Explorer*. The Explorer—perhaps Alexander Mackenzie—having reached the edge of civilization and hearing that there was nothing further to discover, settled down.

Till a voice as bad as Conscience rang interminable changes

In one everlasting Whisper day and night repeated—so
"Something hidden go and find it Go and look behind the Ranges

Something lost behind the Ranges Lost and waiting for you Go"

In medicine and particularly in ante-natal pædiatrics there are still large and unexplored territories of knowledge hidden behind the ranges of ignorance. The command "Go and look behind the Ranges" is addressed to all of us fortunately, thanks both to nature and to nurture, we still possess the pioneering spirit of our forefathers. We may never make any great discovery but should we be fortunate enough to do so we shall be able to say with Kipling

It's God's present to our nation

Anybody might have found it, but His whisper came to me

Did it ever occur to you that our language is full of suggestions that it is a privilege to work sitting down? We respect our Chairman, we Canadians honour the throne, we speak of a Professor's chair, a seat in Parliament, an Archbishop's see, as the crown of a career. The lawyer looks to the judge's bench, and so too the Turks spoke of their Divan, and the Hebrews of the Sanhedrin, all in the same sense. Even the word "President" means "the man in the best seat". All this betokens a habit of mind, of respecting the man who does his work sitting down. Most kinds of research, however, are done standing up, or at best perched insecurely upon a laboratory stool. Distrust the man who says he can do research from his desk by issuing orders to his technicians, such a man will never find anything that he does not expect to find, he is not exploring nature, he is exploring his own skull.

IS AMOEBIASIS A MEDICAL PROBLEM IN CANADA?

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IN 1890 Sir William Osler¹ reported on the first case of amœbic dysentery to be diagnosed in the United States. Only two years later A. Brayton Ball² recorded the case of a Scotsman who had lived in Winnipeg, Manitoba, for two years before he developed amœbic dysentery. This is the first record of an *Entamoeba histolytica* infection in Canada. While this case may not have originated in Canada, Finlay and Wolbach³ in 1910 reported a case of amœbic colitis associated with multiple liver abscesses which came to autopsy, in a French-Canadian who had never been out of Canada. Bates,⁴ in 1925, reported a fatal case of amœbic colitis in a woman who had never been outside of Ontario. In 1933, McLean⁵ reported six cases of amœbic dysentery which occurred in Winnipeg during that year, only two of whom had been to the tropics.

In latter years there has been a tendency to survey so-called healthy groups of the population in an attempt to determine the carrier rate of *E. histolytica* infections. This has been especially true in the United States, where numerous and extensive surveys have been carried out. In Canada there have been relatively few surveys. Porter⁶ in 1934 examined 139 patients and found that eighteen, or 13%, were infected with *E. histolytica*. In 1936 Fantham and Porter⁷ published a report on the examination of 536 persons for *E. histolytica*, sixty-three, or 11%, were found positive. Berzoff-Gillo⁸ in 1936, found 12% of 400 patients showing clinical symptoms, positive for *E. histolytica*. The above mentioned surveys were all carried out in Montreal and while they show that *E. histolytica* infections are not uncommon they cannot be accepted as incidence figures for the general population because these workers were dealing for the most part with clinical groups.

Miller,⁹ in 1939, carried out in Saskatchewan a survey in which he examined three population groups: a hospitalized group, a "healthy"

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group, and an institutionalized group. As only a very small percentage of the hospitalized group were suffering from gastro-intestinal symptoms they were included with the healthy group as representative of the general population. Of 202 thus examined, two, or 1%, were found infected with *Entamoeba histolytica*. The institutionalized group were members of a children's orphanage, forty-seven were examined and eleven, or 23%, were found infected. Kuitunen-Ekbaum,¹⁰ in 1940, examined 324 persons for *E. histolytica* in Toronto and found 1% positive. Bews and Choquette,¹¹ in 1943, examined 500 Canadian soldiers stationed in Canada and found five, or 1%, positive for *E. histolytica*. Williams¹² surveyed 100 Canadian troops in Canada for indigenous *E. histolytica* and found that two were positive, but that one of these had spent some time in the United States, he therefore considered the carrier incidence to be 1%. Routine stool examinations of 180 medical students at Queen's University (unpublished records) revealed five, or 3%, *E. histolytica* infections. Thus, if we ignore the clinical and institutionalized groups we find that, of the general population a total of 1,306 persons have been examined and that, of these, fourteen or approximately 1%, were infected with *E. histolytica*.

Surveys carried out on Canadian service personnel returning from heavily endemic amoebiasis areas have shown that the carrier incidence among these groups is much higher. Thus Miller¹³ examined 209 army personnel who had returned from the Mediterranean theatre of war and found *E. histolytica* in 11% of those examined. Williams¹¹ found a 13% incidence in 500 Canadian troops returning from various subtropical theatres of war.

The finding of a 23% incidence of *E. histolytica* infections on a single stool examination in a children's orphanage in Saskatchewan was surprisingly high. However, a recent survey carried out by Miller and Choquette¹⁴ in Montreal among the inmates of two institutionalized groups confirmed the Saskatchewan findings. One was a children's orphanage, and of 163 children (ages 8 to 11 years) examined, sixty-one or 37%, were positive for *E. histolytica*. The other was an old folk's home, 151 men (ages 50 to 95 years) were examined and thirty-one, or 20%, were found infected with *E. histolytica*. It should be mentioned that in the above

surveys three stools were examined for each individual.

If we add the *E. histolytica* infections found in institutionalized groups together with those found in such specialized groups as service personnel returned from tropical and subtropical zones to the infections in the general population we will get an infection incidence which will be greater than the 1% indicated by the figures obtained for the surveys quoted above. Further, if we take into consideration the fact that, only a single stool examination was done in a percentage of the cases in surveys of the general population we will realize that the incidence of infection of 1%, is considerably lower than the actual figure. It is the writer's opinion that the overall incidence of *E. histolytica* in Canada is approximately 2%. This means that about 240,000 Canadians harbour this parasite.

The question now arises as to the clinical significance of *E. histolytica* infections in this country. While it is true that amoebic dysentery does not occur as frequently, nor do as large a percentage of those infected with *E. histolytica* show clinical manifestations of the infection in the temperate zones as in the tropics, it is equally true that endemic amoebic dysentery does occur in Canada. Thus we have the cases referred to by Bates, Emley and Wolbach *vide supra*. In his survey in western Canada in 1938 the writer saw a case of acute amoebic dysentery in a farmer who had not been out of Saskatchewan for thirty years. In 1945 a case of amoebic dysentery was seen in an airman stationed in England whose symptoms dated back very clearly to a period before he left Canada.

In order to obtain a more accurate estimate of the clinical amoebiasis occurring in Canada a letter was circulated throughout the larger hospitals in Canada requesting information on the number of admissions for amoebiasis during the past ten years. In addition, requests for information on amoebiasis were sent to each provincial health department. Of fifty-one letters sent out to hospitals, thirty replies were received and these included all but one of the teaching hospitals. The numbers of admissions during the years 1936 to 1945 inclusive are tabulated below.

1936	33	1941	4
1937	33	1942	4
1938	25	1943	10
1939	9	1944	15
1940	10	1945	19

Thus, for the ten years 1936 to 1945, figures obtained from the hospital records available show that a total at least of 162 persons were hospitalized for amoebiasis throughout Canada. Additional information obtained from hospital records showed that the Vancouver General Hospital had five fatal cases of amoebiasis in the years 1933 to 1945, during the years 1929 to 1937 the Toronto General had four deaths due to amoebiasis. From 1936 to 1943 the Royal Victoria Hospital in Montreal had eleven cases diagnosed clinically as amoebiasis which came to autopsy. Of these, four showed pathological changes suggestive of amoebiasis, one had a liver abscess.

Replies received from the Provincial Health Departments did not add a great deal of information. In Nova Scotia, amoebiasis has been reportable for twenty years, with no cases reported. New Brunswick has not made amoebiasis a reportable disease. In Quebec, amoebiasis is not reportable. Amoebiasis has been reportable in Ontario since 1915, with only five cases reported since that time. In Manitoba, amoebiasis was made reportable in

1933 with a total of twenty-six cases reported since that time of which twelve died. In Saskatchewan, amoebiasis has been reportable for many years (the exact date is not available) and to the present, eight cases have been reported. Amoebiasis was made reportable in Alberta in 1943 but there are no figures available for the number of cases since that time. In British Columbia, amoebiasis has been reportable since 1924, but only two cases have been reported since that time. These figures are all obviously incomplete, as evidenced by hospital records obtained. Information received from the Bureau of Vital Statistics is tabulated in Table I. According to these figures, from 1924 to 1945, a total of only ninety-three cases of amoebiasis have been reported in Canada. This information only tells us that not all cases of amoebiasis are reported to the Department of Vital Statistics. However, the mortality figures for amoebiasis are more impressive and show that for the four years 1940 to 1943 there were fourteen deaths in Canada due to this disease.

TABLE I

CASES OF AMOEBIC DYSENTERY REPORTED BY PROVINCIAL HEALTH DEPARTMENTS TO THE DOMINION BUREAU OF STATISTICS, DURING THE YEARS, 1924-1945

Year	Canada (1)	P E I	N S	N B	Que	Ont	Man	Sask	Alta	B C
1924										
1925										
1926										
1927	4									
1928										
1929										
1930	15									15
1931										
1932										
1933	3						1			2
1934	10				4	1	1	2		2
1935										
1936	4						3	1		
1937	2			1			1			
1938										
1939	6				5		1			
1940	2				2					
1941	22				16	6				
1942	1				1					
1943	12					3	7			2
1944										
1945 (2)	13					10	3			

(1) Exclusive of Yukon and Northwest Territories

(2) Preliminary figures subject to revision

DEATHS FROM AMOEBIC DYSENTERY IN CANADA BY PROVINCES, 1940-1943

Year	Canada	P E I	N S	N B	Que	Ont	Man	Sask	Alta	B C
1940	4				3					1
1941	2					1			1	
1942	6		1		3	1			1	
1943	2					1	1			

It is readily realized that a true morbidity rate for amoebiasis in Canada is next to impossible to obtain. The figures obtained from hospital records quoted above must be considered incomplete because not all the hospitals replied, and also because in most medical centres clinical amoebiasis is undoubtedly more frequently overlooked than it is diagnosed. About all that can be said is that indigenous clinical amoebiasis does occur in Canada, that it can be a most serious condition, and that it should not be looked upon in this country as an exotic rarity. However, it would appear that of the persons infected, the percentage showing acute clinical manifestations of amoebiasis in Canada is not large.

The fact that the percentage of *E. histolytica* infections in the tropics showing severe clinical symptoms, is much greater than in temperate zones, has worried parasitologists for many years, and, to explain it, many theories have been proposed of which the following four are probably the most authoritative.

1. There is the theory of Emile Brumpt¹⁵ who divides *E. histolytica* into three distinct species, morphologically identical but physiologically distinct in that only one has the ability to invade tissue. The pathogenic species he designates *Entamoeba dysenteriae* and it has two strains, a normal sized strain and a small or minuta strain. Of the non-pathogenic species, one he calls *E. dispar*, which is morphologically identical with the normal sized strain of Brumpt's *E. dysenteriae*, the other is a small species identical in appearance with *E. dysenteriae* minuta strain, which he calls *E. hartmanni*. According to Brumpt, only *E. dysenteriae* can cause disease and it is the prevalence of this species in the tropics and its comparative rarity in temperate areas that explains the high rate of acute amoebiasis in tropical zones as compared with temperate regions. The only way to differentiate these species according to the above mentioned author is by animal inoculations, using kittens in which only *E. dysenteriae* will cause dysentery. This theory is not generally accepted.

2. Charles F. Craig¹⁶ holds the opinion that *E. histolytica* is an obligate tissue feeder within the body, and if present within the intestinal tract must of necessity cause lesions no matter how inconspicuous. According to Craig, the factor which limits the degree of tissue damage is the ability of the host to replace destroyed

tissue. Apparently persons in temperate zones are better able to repair tissue damage than those in the tropics.

3. Several investigators, including Melenev and Frye,¹⁷ working with different strains of *E. histolytica* and kittens have presented evidence suggesting that different strains of this parasite differ in their degree of virulence. It would follow then that only where virulent strains occur will there be clinical amoebiasis.

4. Finally, we have the most recent concept which postulates a composite etiology for acute amoebiasis, in which the organism *E. histolytica* plays only a part. Deschiens,¹⁸ Spector,¹⁹ Nauss and Rappaport,²⁰ have all presented experimental evidence which suggests that certain bacteria enhance the pathogenicity of *E. histolytica*. Nauss and Rappaport²⁰ and Deschiens and Decourt²¹ have also shown that the enteritis initiated by croton oil favours the development of acute amoebic dysentery in kittens.

In the writer's opinion acute amoebic dysentery depends on two factors, the first being the presence of *Entamoeba histolytica* in the bowel, the second, the presence of some extrinsic factor independent of the parasite or the host, which acts in some way to enhance the invasive power of the parasite and produces amoebic dysentery. Without one or the other, amoebic dysentery cannot develop, and it is probably because this extrinsic factor occurs more frequently in the tropics that we have a higher incidence of amoebic dysentery in these areas. That amoebic dysentery can develop in non-tropical zones and even assume epidemic proportions when the two factors come together, that is, *E. histolytica* and the extrinsic factor, is well demonstrated by the Chicago epidemics of 1933.²²

As to the nature of the extrinsic factor involved, at present we can only make a guess. Experimental work quoted above suggests that it is something which causes an inflammatory condition of the large bowel mucosa. However, whether it acts by breaking down the natural resistance of normal host mucosa or by stimulating the cytolytic powers of the parasite cannot be stated at this time.

The problem of chronic and carrier amoebiasis is to us in Canada a much more serious one. With one quarter of a million of the population infected, it is important to know what symptoms, if any, the parasite is causing. According to Craig and Faust²³ all *E. histolytica* infections cause tissue damage no matter how minor. These

authors also believe that if a thorough clinical examination is made about 50% of all infections will show specific symptoms. Sapeio²⁴ has presented evidence to support this view. If this be true then amoebiasis must be considered as a medical problem of some importance in Canada. How important this problem is will depend on the results of careful clinical studies of so-called carriers of *E histolytica* in Canada.

One more point should be brought up with reference to *E histolytica* infections. It is well established that certain persons harbour *E histolytica* without showing clinical manifestations of any sort. The writer has studied a number of such cases who were completely asymptomatic, and who showed no demonstrable bowel lesions on sigmoidoscopy. The question of whether or not the patient should be treated brings up a controversial point. However, since treatment with some of the newer iodine compounds has been fairly successful and untoward symptoms of treatment are not serious, it is probably advisable to institute treatment in these cases. On the other hand, the finding of *E histolytica* cysts in the stool of a patient does not mean *ipso facto* that a diagnosis has been made and that further clinical and laboratory investigation should cease. The finding of amoebae may be incidental and serve to divert the attention of the physician from the real etiology of the disease. The exercise of good clinical judgment is all-important in enabling the physician to decide whether the *E histolytica* infection explains all the symptoms, whether the parasite is only playing an accessory rôle in the clinical picture, or whether the amoebae are relatively inactive and are not concerned in the etiology of the clinical condition at all.

In conclusion one might say that amoebiasis is a medical problem in Canada, although not a major one. There will continue to be sporadic indigenous as well as imported cases of acute amoebiasis, and while the number will not be large, amoebic dysentery and, more rarely, amoebic hepatitis and liver abscess, will occur and should be kept in mind in the differential diagnosis of such conditions. Finally, we have a comparatively large pool of chronic and carrier amoebiasis some of whom are undoubtedly showing symptoms of infection, the severity and nature of which will await further clinical investigations.

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RÉSUMÉ

Entre 1935 et 1945 on a rapporté 162 cas de dysenterie amébienne au Canada, et de 1940 à 1943, 14 malades sont morts de cette maladie. 2% de la population, soit 240,000 Canadiens sont atteints d'amébiase. Plusieurs théories de pathogénie sont discutées, et il semble admis qu'il doit exister un facteur extrinsèque indispensable pour que l'*E histolytica* devienne pathogène, ce facteur n'est pas clairement établi et il est probablement variable.

50% des porteurs présentent des signes cliniques à des degrés divers. Il importe de bien connaître ces signes. Dans ces conditions, l'amébiase constitue pour nous un problème d'importance grandissante et il importe d'y penser fréquemment, de l'étudier et de l'approfondir.

JEAN SAUCIER

"The hope that some day we may be able to find out exactly which enzymic process is at fault in diabetes, and so be able by rectifying the fault, to combat the disease, may not be so visionary as some are disposed to believe"—Diabetes Its Pathological Physiology, J. J. R. Macleod, 1913

THE TREATMENT OF SOME SURGICAL COMPLICATIONS OF AMOEBIASIS

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BEFORE the war amoebiasis was an uncommon disease in Canada. It was perhaps present, in a latent form, in about 1% of the population.¹ But among the armed forces which served in the Far East, India, Ceylon, and the Middle East it was a major problem for the medical services. Its incidence was high, diagnosis difficult, treatment often unsatisfactory, and relapse rate disappointing. In addition to those in whom the disease was sufficiently severe to require hospitalization, many suffered either no discomfort or only trifling and transient symptoms which rapidly subsided, and a high proportion of these became carriers and cyst-passers. It is likely, therefore, that many returned men who have served in tropical countries will bring back with them, in addition to other legacies of war, the *Entamoeba histolytica* and amoebiasis will become more common in this country and its diagnosis and treatment more numerically important.

THE PATHOLOGY OF AMOEBIASIS

In its active vegetative stage the *Entamoeba histolytica* readily penetrates human tissues. Its most common portal of entry is the mucous membrane of the large bowel through which it passes into the submucous layer, where it multiplies and gives rise to a gelatinous exudate containing relatively few cells. The mucous membrane overlying the exudate becomes necrotic and sloughs, leaving ulcerated areas the extent of which varies widely from case to case. In some there are only small scattered patches of ulceration in the proximal large bowel and the intervening mucosa remains healthy. In others practically the whole colon and appendix is involved in the process and becomes extensively denuded of epithelium. In either case secondary infection by bowel bacteria takes place and greatly adds to the dangers of the disease.

From the submucosa the organism may penetrate the muscle and peritoneal layers of the colon and give rise to peritonitis, with or

without visible perforation. It may also invade radicles of the portal system and thus be carried to the liver where it sets up inflammatory changes and abscess formation. From the liver the general circulation may be entered and the *Entamoeba* may be deposited in the lungs, spleen, and even the brain.

COMPLICATIONS

It will readily be appreciated that a wide variety of complications, some of them of surgical interest, may follow infection with the *Entamoeba histolytica*. These may be divided into the complications of the disease in the bowel, amoebic hepatitis and its complications, complications due to more widespread dissemination.

The more important surgical complications of the disease in the large bowel are pericolic infection, with or without perforation, pseudo-appendicitis, hæmorrhage, and amoebic granuloma.

Pericolic infections not infrequently occur in acute amoebic dysentery and may arise with or without obvious perforation of the bowel. They are most common in the cæcal region where they give rise to symptoms closely resembling acute appendicitis. Such cases usually give a history of past or recent dysentery, which may be of any degree of severity from a mild bowel upset with the passage of a few diarrhoeic stools a day for a day or two, to a fulminating dysentery. There is pain, tenderness, rigidity in the right side of the abdomen, a considerable leucocytosis, marked toxæmia, and a mass which ascends from the right iliac fossa towards the hepatic flexure. In many cases the thickened ascending colon can be felt above the inflammatory swelling, and the liver may be enlarged and tender. In practically all cases the *Entamoeba* is present in the stool or can be recovered by sigmoidoscopy. If such a case is subjected to operation the cæcum and ascending colon will be found to be irregularly thickened, will often closely resemble damp blotting paper, and will always be extremely friable. The appendix is commonly involved in the process and its removal is disastrous as secondary perforation nearly always follows. If the true nature of the disease is suspected before operation, and appropriate medical treatment instituted, marked improvement will be obtained in two or three days. Some, and they are those without a frank

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perforation, resolve completely, others, however, develop an abscess in relation to the colon which will require drainage, a good recovery usually ensuing

If however, the abdomen is opened, and the typical dysenteric lesions are found, the para colic gutter should be drained without removal of the appendix. Emetine should be given without delay, for without specific therapy these cases frequently develop a progressive phagedenic sloughing of the abdominal wall which often terminates fatally. If at operation the appendix is found to be acutely inflamed it should not be removed, but should be exteriorized or anchored as near the surface of the abdomen as possible, to be dealt with later when the specific infection has been brought under control. With such treatment the great majority of these cases will recover, unless the mere extent of the bowel lesions overwhelms the patient.

Although considerably rarer, complications similar to those just described for the right half of the large bowel may also occur in the descending colon and rectum. In spite of the advantage enjoyed by the left colon in possessing no vermiform appendix, and consequently being less frequently the object of attack, the mortality from peritonitis is high, as localization after perforation is usually incomplete. The clinical features are characteristic. There is dysentery, usually of a severe type, with considerable pain in the left lower abdomen. Coincident with perforation, the lower abdominal pain increases, the patient's condition deteriorates rapidly, and the signs of a spreading peritonitis appear. Initially, treatment should be similar to that outlined for infections of the right colon but in addition, as soon as the presence of a pelvic peritonitis is beyond doubt (usually within twenty-four hours of perforation), the pouch of Douglas should be drained either through the rectum or posterior vaginal fornix. These cases have a high mortality even with prompt diagnosis and efficient treatment. It is as yet too early to assess the influence of penicillin and sulfadiazine therapy on them, but it is probable that, even with their aid, more than 5% will die of this complication of amoebiasis.

Hæmorrhage. Some blood is always present in the stools of patients with acute amoebic dysentery. The amount lost is rarely, by itself,

serious though in chronic cases a marked secondary anæmia may develop. But occasionally catastrophic hæmorrhage may occur. Most of these rapidly respond to blood transfusion, penicillin, and emetine therapy, but some may continue to bleed ferociously and may lose ground in spite of continuous and rapid blood replacement. The situation then facing the surgeon is as difficult as that of the bleeding peptic ulcer which does not respond to medical treatment. The bleeding may be coming from any part of the large bowel, it may be impossible, at operation, to find the bleeding area, and the bowel is extremely friable and does not lend itself to manipulation.

I have only once had to deal with such a case, although I have knowledge of three others which ended fatally. In my own case, which was almost certainly amoebic though this was never proved, the patient required 19 pints of blood in five days and yet progressively lost ground. His only tender area was in the right lower quadrant. At operation under local anaesthesia the first inch of the ascending colon was thickened, very friable, and looked like wet blotting paper. It was patent that the bleeding was coming from this area, the bowel refilling with blood almost as rapidly as it was milked away. Any extensive procedure was completely out of the question owing to the patient's general condition. The ileo colic artery was therefore ligated above its bifurcation into its superior and inferior branches, appreciable blanching of the caecum resulting. The bleeding ceased and the patient thereafter made an excellent recovery. I was indeed fortunate in the outcome of this case, but I make the suggestion, for what it is worth, that when faced with this problem the surgeon should expose the bowel in the most tender area of the abdomen and radically reduce the blood supply to any dysenteric lesion found.

Amoebic granuloma is rare and when it occurs it may easily be mistaken for carcinoma. Careful preoperative study and a course of emetine usually serve to distinguish between the two conditions. Although there appears to be no increase in the incidence of cancer of the bowel in dysenteric patients, it should always be remembered that it may develop in cases with chronic amoebic dysentery and that the two conditions may co exist.

AMOEBIIC HEPATITIS AND ITS COMPLICATIONS

Amoebic hepatitis is the most common and most serious complication of intestinal amoebiasis. It may arise at any stage of the disease in the bowel and may appear in a wide variety of forms. If unrecognized and untreated amoebic hepatitis goes on to suppuration, with the formation of liver abscess a complication formerly second only to typhoid as a cause of mortality in the British Army in India. Amoebic hepatitis and liver abscess are merely early and late stages of infection of the liver with the *Entamoeba histolytica*. Hepatitis rapidly responds to emetine therapy, abscess on the other hand, even with modern methods of treatment, results in a mortality of between 2 and 5%. In prevention, therefore, lies the essence of treatment and abscess should only develop in neglected and undiagnosed cases of amoebic hepatitis.

Pre-suppurative amoebic hepatitis exhibits every gradation between an intensely acute inflammation of the liver and a most chronic and insidious illness. It may appear shortly after the initial infection of the gut with amoebæ, or may be delayed for many years after all dysenteric symptoms have subsided and long after the sufferer has left the tropics. In the acute form there is often a history of recent dysentery or diarrhœa. There is a high fever of an irregular remittent type accompanied by profuse sweating. The liver is enlarged and tender and the right (or left) lobe of the diaphragm is elevated and fixed. The cæcum and other parts of the colon are often thickened and tender and frequently there is amoebic ulceration in the rectum. Leucocytosis is present and may be as high as 30,000 per cmm, 80 to 90% of the cells being polymorphonuclears. Jaundice is not usual and if present is of mild degree. There is commonly intercostal tenderness with signs of diminished air entry into the right lower lobe. A small pleural effusion may be present in the right chest when the inflammation has spread through the diaphragm.

The chronic form also commences with fever which may be the only sign for weeks. Some enlargement of the liver is generally present but there often is no pain and no tenderness in the right upper abdominal quadrant. A moderate leucocytosis is usually present, with a relatively low polymorphonuclear count.

There is nearly always diminution or loss of movement in the right side of the diaphragm.

Once the diagnosis of amoebic hepatitis has been made a course of emetine should be administered. If only hepatitis is present the temperature will fall to normal within a week, the leucocytosis will disappear, and abscess formation will have been averted. If, however, there has been delay in emetine administration, after a pre-suppurative stage which may last for from two weeks to more than a month, abscess formation will occur. Emetine will now fail to produce a fall in temperature and a high white blood cell count will continue to be present. The liver will remain enlarged and may even increase in size. X-ray examination will reveal, in addition to elevation and fixation of the diaphragm, "humping" or irregularity in its outline. Pain, both in the lower chest and in the region of the acromion will continue. There will be a tendency to stoop to the right, and coughing on deep inspiration, loss of appetite, malaise, languor, and general debility will become well marked. After a variable period the abscess will point in the xiphisternal junction, below the costal margin, in the renal angle, or through the chest wall.

The larger amoebic abscesses of the liver vary in situation and number. In approximately 70% of cases the abscess is single and is confined to the right lobe, the posterior and upper part being the most common site. In the remainder there is more than one abscess but the number rarely exceeds four. Of the single abscesses only 15% occur in the left lobe and these may burrow into the base of the left lung, the pericardium, stomach, or lesser sac or peritoneum. In the right lobe abscess penetration may occur into the right pleura or into the lower lobe of the right lung if it is adherent to the diaphragm.

In the early stages the content of a liver abscess is yellow necrotic tissue which later becomes chocolate coloured from admixture of blood and destroyed liver substance. It looks very like anchovy sauce, is viscid and not offensive, and may not contain amoebæ, though these are nearly always found in scrapings from the wall of the abscess cavity. Secondary infection with pyogenic organisms is rare, though later this frequency takes place after rupture or surgical interference.

TREATMENT OF AMOEBIC HEPATITIS AND LIVER ABSCESS

The treatment of either condition commences with a course of emetine hydrochloride injections, 1 grain per day being given intramuscularly for 10 to 12 days. If there is only hepatitis without suppuration, rapid cure will result, the temperature falling to normal within a week and the enlargement of the liver and the leucocytosis also largely subsiding.

If, after 7 to 10 days of emetine administration, symptoms and signs do not disappear, abscess formation has taken place. Exploratory aspiration of the liver with a medium sized trocar and cannula should then be carried out with full aseptic precautions under pentothal anaesthesia. The liver should be systematically explored to a depth of not more than 3.5 inches, and as many as six punctures may be required before pus is found. The abscess, which may contain as much as 80 to 100 oz of pus, should be thoroughly evacuated, and it is good practice to instill 100,000 units of penicillin in 20 cc of distilled water into the abscess cavity at the conclusion of the operation. It may be necessary to repeat this procedure in a week or ten days if the abscess cavity refills and fever and leucocytosis persist, but usually there is considerably less pus at the second operation and it is uncommon for more than three or four such aspirations to be needed.

After the first course of 10 to 12 days of emetine injections has been completed an interval of 10 days should elapse before a second shorter course of 8 daily 1 grain emetine injections is given. This should be followed, as in all cases of amoebic dysentery or its complications, by a course of emetine bismuth iodide or diodoquin to destroy any entamoebæ which may be lurking within the lumen of the bowel.

Under such a regimen the vast majority of cases of amoebic hepatitis and liver abscess will recover. A few, however, will suffer from a protracted illness as the result of extension of the abscess to surrounding tissues, the pericardium, the pleuræ, and the lungs. These will require, in addition to the specific emetine therapy, surgical drainage according to accepted principles and procedures, but the maxim in all should be to delay interference for as long as possible, because the curative powers of emetine in amoebic dysentery and its

complications may be reckoned as among the miracles of medicine.

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RESUMÉ

L'*Amoeba histolytica* entre habituellement dans l'organisme par la muqueuse du colon d'où elle envahit le foie, et parfois, d'autres viscères. Les complications de l'amoebiose sont la péricolite, l'hémorragie, l'hépatite et les abcès du foie. La péricolite amène parfois des perforations et donne lieu à un aspect d'appendicite dont le traitement est très délicat et surtout conditionné par l'état lésionnel observé. L'hémorragie nécessitera selon les cas les sutures artérielles, notamment la suture de l'ileo colique. Le granulome, complication rare, simule souvent le carcinome. L'hépatite répond bien à l'émétine, mais si complication, l'abcès du foie, devra être traité chirurgicalement. La marche à suivre et les soins nécessaires sont décrits. J. F. A. SAUCIER

THE ROLE OF THE EMOTIONS IN THE PRODUCTION OF CARDIOVASCULAR DISTURBANCES

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SUDDEN fright produces palpitation and tachycardia which is the simplest example of the rôle of the emotions in the production of cardiovascular disturbances. The effect of long continued fear, tension, or anxiety in the production of persistent cardiovascular symptoms is, of course, equally obvious and is the commonest cause of the symptom complex called neurocirculatory asthenia.

Very careful and complete examination of patients who complain of cardiovascular symptoms will reveal the fact that the majority present no objective evidence of organic heart disease, but are rather suffering from a so called functional heart condition, the commonest of which is called neurocirculatory asthenia. In this discussion we must remember that these functional disorders involve the peripheral circulation as well as the heart. In addition to a description of neurocirculatory asthenia, an attempt will be made to indicate the responsibility of the medical profession both in the diagnosis and treatment, for it so happens that, as doctors, we may on occasion cause or aggravate rather than cure the very subject of our discussion.

* Read at the Seventy-seventh Annual Meeting of the Canadian Medical Association, Section of Psychiatry, Banff, Alberta, June 14, 1946.

The emotions may act on the damaged as well as the intact cardiovascular apparatus but for the purpose of this discussion it would seem best to confine ourselves to the functional disturbances produced in patients with apparently normal heart and blood vessels. The great majority of these functional conditions are included within the all-embracing term of neurocirculatory asthenia and, because of the great frequency with which it occurs and the largely preventable disability it may produce, this malady deserves our careful consideration.

Neurocirculatory asthenia has also been called effort syndrome, soldier's heart, and disorderly action of the heart. Effort syndrome is obviously a poor name implying that effort is responsible for this trouble and suggesting the fear of physical activity to the patient so labelled. Soldier's heart is also a misnomer which is happily being dropped. Disorderly action of the heart (D.A.H.) is inadequate since, while many patients with neurocirculatory asthenia do have extrasystoles, paroxysmal tachycardia, or even paroxysms or auricular fibrillation there are many who never show any cardiac irregularity. The name neurocirculatory asthenia seems fitting because it indicates the involvement of nervous and circulatory systems and the weakness which is often a cardinal symptom.

Neurocirculatory asthenia occurs in adults of both sexes, the ages most commonly affected are the same as for neuroses. It is never found in young children but the "teens" may see it, and while it is rare in middle or old age, these patients are not entirely immune. It is probably true that those susceptible to these nervous disorders will manifest them in their twenties or thirties. Neurocirculatory asthenia can occur as a mild transitory manifestation resulting from some obvious emotional strain, or it may at times produce a severe and persisting disability. The medical profession bears a grave obligation in this connection because early diagnosis and adequate treatment will go a long way to prevent this disorder, whereas careless diagnosis or improper treatment may either produce the whole symptom complex or establish it so firmly as to increase the resulting disability.

As in every condition that we encounter, the first step in the diagnosis is a careful history, and the taking of this history not only reveals

the way in which the symptoms have developed but permits us to gain the insight into the patient as an individual that becomes so important once the diagnosis of this condition is made and treatment is undertaken.

At the risk of repeating what seems already well known it would probably be wise to review in detail some of the commoner symptoms of this disorder. This is particularly important because these symptoms may individually occur in a variety of other conditions and may of course have in that case quite different connotation. Probably the commonest presenting complaint in neurocirculatory asthenia is *palpitation*, which may be the common fluttering or "butterflies" associated with tachycardia, or may consist of a consciousness of the heart-beat even though the rate is normal. "Throbbing" may be the patient's description of this symptom and this sensation may be limited to the precordium or chest or it may be felt all over the body. Extrasystoles are of course common, and are described as the heart "flopping", "turning over" or "missing a beat". In some patients such irregularity is very disturbing, while in others it may not produce any conscious effect. The frequency of paroxysmal tachycardia, which is a succession of extrasystoles, has been emphasized by recent studies of Friedman.¹ Characteristic of paroxysmal tachycardia are the sudden onset and sudden cessation, evidence of which can usually be obtained from the history, as in short paroxysms, it is uncommon to have the doctor on hand during the attack. Friedman adds the interesting observation that these attacks of paroxysmal tachycardia are preceded by evidences of "nervous discharge" shown by tremor, hyperthermia, sweating, pallor, and that these symptoms persist after tachycardia subsides, either spontaneously or as a result of treatment. This indicates to him that the tachycardia, like the other nervous symptoms, is due to central, probably hypothalamic disturbance. Tachycardia, either sinus or paroxysmal, may persist for years without damage to the myocardium.

Dyspnoea is the rule but it is not the shortness of breath on exertion that is characteristic of organic heart disease. The patients with neurocirculatory asthenia complain of dyspnoea at any and occasionally at all times. The respiratory rhythm may be irregular or they

may complain that they cannot get enough breath, and sighing is frequent. They are more apt to show dyspnoea on excitement than effort, and in a few cases exercise actually abolishes the shortness of breath. Orthopnoea practically never occurs unless by suggestion or because of familiarity with a case of organic heart disease. Hyperventilation may occur and set up the characteristic symptoms attributable to the resulting alkalosis.

Cardiac pain in this condition is apt to be of two sorts. The commonest is the submammary distress at or below the apex of the heart. This may be a constant ache, or it may come only at times of increased stress or strain. While often attributed to effort by the patient, careful questioning will reveal the fact that the pain comes during or long after the exertion, but is not relieved by rest. In this respect it differs from the pain of coronary artery heart disease which comes with effort and is immediately relieved by rest. The latter type of pain is, of course, almost always behind the sternum, a site rarely taken by the pain of neurocirculatory asthenia. This submammary or apical pain can vary from a distress or burning sensation to an ache or a sharp pain. The other type of pain encountered in neurocirculatory asthenia is the lancinating distress described as like the thrust of a needle or sharp knife, and is transitory, apical, and not related to effort.

The weakness or fatiguability that these patients complain of is that found so commonly in the psychoneurotic. They find it difficult to carry on with their usual duties though they present no definite evidences of muscle weakness such as is found in hyperthyroidism. They tire easily and lack stamina or staying power. They often complain that they get tired in the morning.

Nervousness in greater or lesser degree is always present. This may be associated with a tremor, or may only show itself by inability to concentrate or to sit still. The tremor may be constant and resemble that seen in hyperthyroidism, or it may come at times of increased tension, to which the patients are so readily susceptible. With the tremor is usually found cold wet hands, again unlike hyperthyroidism, in which the extremities are warm.

Insomnia is often troublesome and can, of course, aggravate the other nervous symptoms. It is of interest that White has recently pointed out that insomnia may be the first early symptom of left ventricular failure. Hyperthermia, with an oral temperature of 99 to 99.4° is occasionally found.

That emotional instability is common in these patients is well known, and was aptly described by the young negro woman who was being presented before a clinic at one of the annual meetings of the American College of Physicians. In her anxiety to give the presiding doctor all the help she could she replied, in response to his query as to whether she cried easily, by saying, "Doctah, ah cries so easy that sometimes ah thinks mah bladder is right in mah eyes."

The cold extremities found on examination have been mentioned, but in addition there are the patients who complain of a subjective sensation of cold hands and feet. It is surprising how many patients with this complaint consult a doctor, convinced that their cold extremities are due to serious heart disease.

Giddiness is another common symptom and may consist of a momentary unsteadiness on change of posture particularly on getting up quickly, or a more severe vertigo. Occasionally this giddiness leads to a feeling of faintness, although real fainting with loss of consciousness is rare.

In short, in neurocirculatory asthenia we find most of the symptoms that are usually experienced by the patient with organic heart disease, plus those that are definitely nervous in origin. It should be clear, however, that careful study of these symptoms will show important and definite differences when compared with the complaints offered by patients with organic cardiovascular disease.

Again let us remember that the symptoms of this functional heart disorder may occur in a patient with real structural damage to the heart or blood vessels. Mitral stenosis or aortic aortitis offer no immunity against neurocirculatory asthenia.

Physical examination may reveal nothing but the evidences of the neurotic basis for this condition. There is a more or less common facial expression in neurocirculatory asthenia, similar to any anxiety state, a tense anxious expression that experience can detect even

under the camouflage of modern cosmetics. There is, too, a characteristic manner in which the patients present the multiplicity of their symptoms, and an over-anxiety to detail all the minutiae of their subjective sensations. The physical signs in an uncomplicated case may be only tachycardia, with occasional cardiac irregularity, and cold moist extremities, often with a tremor of the extended fingers. Laboratory findings may be of no help except for the negative value of the normal findings. Master¹ has mentioned a small heart, as shown by x-ray, but in my experience the heart size is of no significance. The finding of cardiac enlargement indicates organic heart disease which may or may not be present in a patient with neurocirculatory asthenia who will in an uncomplicated case show a heart of normal size. The electrocardiogram presents no characteristic findings, but it should be emphasized again and again that minor changes in the electrocardiogram may occur in the course of neurocirculatory asthenia as a result of autonomic imbalance,^{2, 4} and these changes must be interpreted along with the history, symptoms, and physical signs. There is often evidence of disturbance of glucose metabolism shown by a "flat sugar curve" which can be taken as but another evidence of the disturbance of the autonomic nervous system.

The diagnosis of this condition can therefore only be arrived at by painstaking methods. A careful and detailed history is important; a thorough physical examination must be performed and in addition, such laboratory aids as cardiogram and x-ray should be utilized where available. To make this diagnosis, the doctor must have an understanding of the significance of the presenting symptoms and he must be able to separate the wheat from the chaff. He must also understand the underlying nervous basis from which these symptoms arise.

In the differential diagnosis there are four conditions which are most apt to cause confusion: mild hyperthyroidism, early pulmonary tuberculosis, early mitral stenosis, and chronic bronchitis. The hyperthyroidism can usually be distinguished by the persisting tachycardia, warm moist hands with fine tremor of the extended fingers, heat intolerance, muscular weakness, weight loss, and of course the definitely elevated metabolic rate. There are still, however, many border-line cases in which the

distinction between neurocirculatory asthenia and thyrotoxicosis is impossible. A therapeutic test with iodine as Lugol's solution or thionin oil may be necessary. The neurocirculatory asthenia will of course not respond to either of these preparations. Transitions of neurocirculatory asthenia to Graves' disease and the reverse have been reported.⁵ Early pulmonary tuberculosis can also present a very similar picture. Here the differential diagnosis may not be established until x-ray evidence of parenchymal pulmonary disease is apparent. In rheumatic heart disease with early mitral valve involvement the picture presented may be much the same. The history of any of the initial manifestations of rheumatic infection, such as acute rheumatic fever, or chorea, in the patient or in his family, the increased white blood count and sedimentation rate, and the persisting signs of organic valvular involvement, will be helpful. The fact that neurocirculatory asthenia can show a hyperthermia only adds to the confusion with tuberculosis, rheumatic infection and chronic bronchitis. This latter condition must be kept in mind, though it is probably not as frequent as enthusiasts would have us believe. It is to be hoped that chronic bronchitis can be diagnosed by one or more of the immune reactions to that infection.

The medical profession has a grave obligation to patients with neurocirculatory asthenia which may be discussed under two headings. There is the responsibility of the doctor who sees these patients in the first instance and it is here that most can be done, and the subsequent obligation of the doctor who diagnoses and treats the long established case.

The first step in the treatment of any case of neurocirculatory asthenia is a careful diagnosis and there is no class of patient more grateful for a thorough study of their condition than the individual with this disorder. It is here that the medical profession may fail to measure up to its full responsibility. A slipshod examination that reveals a tachycardia and possibly a systolic murmur in a patient complaining of dyspnoea, weakness, and pain in the left chest, has led many a doctor to label the patient as one having a "bad heart." Sometimes the patient is put to bed and his worry is intensified. The mere fact that the doctor says "bad heart" is enough by way of suggestion to produce a long continued disability. It is strange that

the suggestion that something is wrong always seems more potent than the contra suggestion that all is well. In the illustration cited, of course, a strong suggestion that the patient was well and free from organic heart disease, in the *first instance*, and that means the *first time* the patient consults the doctor, would have been most beneficial.

Where we have to deal with a long established neurocirculatory asthenia, it is still true that the first step in treatment is the complete examination already mentioned. We are then faced with the necessity of overcoming by reassurance and suggestion, with the help of medicine, the convictions already fixed that the patient is in a bad way with heart disease. The effect of reassurance and suggestion depends on the way in which it is presented to the patient and, of course, on the insight and judgment of the patient himself. The use of sedatives at this stage is often imperative. Phenobarbital has pretty well replaced bromides because of the greater danger of toxic effects (bromism) from the latter. Phenobarbital should be used in doses sufficient to secure the desired result, a quarter of a grain two to four times a day may be enough, but the more usual dose is one-half grain three times a day. Something for sleep is also indicated since insomnia is so common and since complete rest cannot be secured unless the patient can get a good night's sleep. The milder barbiturates are best employed and any one preparation should be changed from time to time. Tea, coffee, tobacco, and alcohol should probably all be proscribed, at least during the early stages of treatment. These patients do not need to go to hospital, nor do they need prolonged bed rest, and indeed the latter may be very deleterious. The diet should be adjusted to the individual's needs, the fat patients being reduced and the thin ones "built up."

SUMMARY

In neurocirculatory asthenia we have, therefore, an excellent example of one of the really serious cardiovascular disturbances produced by the emotions. The resulting disability may be severe and persistent. Early diagnosis and adequate treatment can do much to prevent and relieve this common cardiac condition.

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RÉSUMÉ

L'asthénie neurocirculatoire est un autre vocable pour désigner la névrose cardiovasculaire. Il s'agit d'un état qui frappe surtout les adolescents. La description qui en est faite ici s'adresse à des individus indemnes de lésions cardiovasculaires, mais la névrose cardiovasculaire peut également coexister chez les cardiaques véritables. La symptomatologie et les éléments du diagnostic sont exposés de façon succincte. Le diagnostic précoce et l'application immédiate du traitement éviteront le passage à la chronicité et permettront de mettre fin rapidement à un état par ailleurs sans gravité.

JEAN SAUCIER

CARCINOMA OF THE BLADDER

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AN analysis of 540 cases of carcinoma of the bladder which were seen in the University Hospitals from 1930 to 1942 showed several features of extreme interest. The high incidence of this disease is recorded in Table I. Five per cent of all admissions to the Urological Department and 0.5% of all admissions to the hospital during this period were patients diagnosed as carcinoma of the bladder. This series does not include small papillary tumours or neoplasms which were smaller than 1.5 cm. in diameter.

TABLE I

INCIDENCE OF PATIENTS WITH CARCINOMA OF BLADDER AT THE UNIVERSITY HOSPITALS

Year	Total admissions to university hospitals	Percentage	Total admission to urological service	Patients with carcinoma of bladder	Percentage
1930	12,048	0.6	948	75	7.9
1931	13,537	0.5	880	68	7.7
1932	14,591	0.3	973	47	4.8
1933	15,783	0.4	1,099	63	5.8
1934	18,232	0.3	1,217	56	4.6
1940	21,564	0.4	1,397	81	5.8
1941	20,996	0.4	1,450	85	5.8
1942	19,068	0.4	1,411	84	5.8
1943	18,233	0.5	1,510	90	5.9
1944	18,040	0.4	1,585	82	5.2
Total	172,092	0.4	12,473	731	5.8

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which could be fulgurated easily with the Buebee electrode through a Brown Bueger cystoscope. The patients under consideration all had definitely malignant tumours.

Table II presents the age distribution in this series. It is interesting to note that several cases occurred in patients from 20 to 29 years of age. The vast majority of patients, however, were in the age period between fifty and eighty years. Since this portion of the population is increasing in numbers, the problem of care of patients with carcinoma of the bladder is developing proportionately.

TABLE II
CARCINOMA OF THE BLADDER
AGE DISTRIBUTION IN 540 PATIENTS

Age	Total series	% of total	Known dead in series	% of total dead
20-29	4	0.7	2	0.8
30-39	16	3.0	4	1.6
40-49	49	9.1	14	5.8
50-59	125	23.1	51	21.1
60-69	199	36.8	91	38.9
70-79	127	23.5	68	28.1
80-89	19	3.5	9	3.7
90-99	1	0.2		
Totals	540		242	

Carcinoma of the bladder usually is considered as a lesion which grows slowly and metastasizes late. In recent years, however, the subject has been studied more completely and it has been demonstrated when postmortem examinations are made that the incidence of metastatic lesions from carcinoma of the bladder may be as high as 30%. It is probable, however, that in patients who are seen earlier the incidence is much lower. In our series of cases metastases were found in 22, or 4.1% of the total. In 12 of the 22, the metastatic lesions involved the skeleton.

TABLE III

CARCINOMA OF THE BLADDER
METASTASES TO ORGANS OTHER THAN THE REGIONAL LYMPH NODES IN A SERIES OF 540 PATIENTS

Bony pelvis	7
Ribs	1
Lungs	6
Femur	2
Liver	3
Inguinal nodes	1
Humerus	2
Total cases	22

The combination of late metastasis and a high incidence of recurrence indicates that an early diagnosis is of much importance and should lead to improved results from all types of treatment. It means that radical removal of the tumour should give a high percentage of cures. In this series of 540 patients the average time interval between the occurrence of the first symptom and the diagnosis was one and one-half years. Obviously, more intensive efforts must be made to educate the public and the medical profession with regard to the significance of haematuria, the symptoms of bladder irritation, and the necessity of complete urological examination in suspected cases (Table IV). It encourages the belief that radical therapy is justified in suitable cases.

The type of treatment which is to be used and the results to be expected depend upon the character of the tumour and the condition of the patient. If the patient is old and has comorbid disease or there are extensive changes in the urinary tract as a result of the presence of the bladder tumour, the type of therapy and the prognosis are much different than when such conditions are not present. All the tumours in this series were classified pathologically as either

TABLE IV
CARCINOMA OF THE BLADDER
PRESENTING SYMPTOMS IN A SERIES OF 540 PATIENTS

Symptom	Number in those living	% of total living	Number of known dead	Number of total deaths	Number in total series	% of total
Haematuria	209	70.0	118	49.0	327	60.6
Haematuria + irritation	25	8.3	15	6.2	40	7.4
Bladder irritation	57	19.0	93	38.4	150	27.8
Epididymitis	1				1	
Bladder neck obstruction	4		4		8	
Renal obstruction, unilateral	1		5		6	
Uræmia	0		4		4	
Weakness	1		1		2	
Passage of small stones	0		1		1	
None	0		1		1	
Totals	298		242		540	

papillary carcinoma, Grades II, III, or IV, epidermoid carcinoma, or adenocarcinoma. From a practical clinical point of view it was found useful to divide the tumours into three main types (Table V) (1) papillary tumours, (2) infiltrating tumours confined within the bladder

had a suprapubic fulguration died of urinary tract infection postoperatively. With earlier diagnosis transurethral resection offers much to patients with tumours who fall in this group.

There were 249 patients with tumours considered to be entirely within the bladder or

TABLE V
CARCINOMA OF BLADDER
TYPE OF TUMOUR IN A SERIES OF 540 PATIENTS RESULTS OF TREATMENT

Type	Total series	% of total	Number controlled	% controlled	Number not followed	Number known dead or dying with disease
Papillary	168	31.1	130	77.4	3	35
Infiltrating within bladder wall	249	46.1	99	39.7	35	114
Infiltrating through bladder wall	123	22.8	2	1.6	—	121
Totals	540	—	231	42.8	38	270

wall, and (3) infiltrating tumours extending through the bladder wall. This differentiation was made upon the basis of the cystoscopic appearance of the tumour, the microscopic appearance of portions of it, and bimanual palpation under spinal or other anaesthesia. There is a striking difference in the percentage of patients "controlled" (living and apparently well) based upon this classification (Table V). From the analysis of the patients who are classified as in the "papillary" group it would seem that with earlier diagnosis and somewhat more extensive therapy almost 100% of patients could be controlled. On the other hand, surgery and radiation therapy offered nothing to those patients who were diagnosed as having tumours "infiltrating outside the bladder wall". The study revealed that possibly more radical surgical therapy was indicated in those patients who had tumours classified as "infiltrating but confined within the bladder wall".

There were 168 patients whose tumours were considered papillary, single, multiple, small, and large (Table VI). The smallest neoplasm was 1.5 cm in diameter. The largest weighed over a half pound, and was distributed very extensively over the bladder in the form of multiple papillary tumours. In this group of 168 patients the disease was controlled in 130, three could not be followed and 23 are dead or dying of the disease. Twelve deaths were due to the operation. Transurethral resection was performed on 167 patients, 11 of whom died of the operation. All of the patients who died had large tumours and two were in very poor condition prior to operation. The one patient who

TABLE VI
CARCINOMA OF BLADDER
TREATMENT OF 168 PAPILLARY TUMOURS

Treatment	No treated	Oper- ative deaths	No con- trolled	No not followed	No dead or dying of disease
Transurethral resection	167	11	130	3	23
Suprapubic fulguration	1	1	—	—	—

bladder wall but definitely infiltrating into the bladder wall (Table VII). In this group, 126 patients were treated only by transurethral resection. In 67 of these the disease is known to be under control. 6 patients died post-

TABLE VII
CARCINOMA OF THE BLADDER
TREATMENT OF 249 PATIENTS WITH INFILTRATING
CARCINOMA CONFINED WITHIN THE URINARY BLADDER

Treatment	No treated	Oper- ative deaths	No con- trolled	No not followed	No dead or dying of disease
Transurethral resection	126	6	67	16	36
Transurethral resection + X-ray therapy	74	—	23	18	33
Partial cystectomy	13	2	5	—	6
Suprapubic fulguration	16	5	1	2	8
X-ray therapy alone	6	—	—	—	6
Radon seeds	1	—	—	—	1
Radium supra- pubically	1	—	1	—	—
Total cystec- tomy	2	—	2	—	—
Ureterointes- tinal anasto- mosis	2	—	—	—	2
Bilateral pyelostomy	1	1	—	—	—
No treatment	7	—	—	—	7

operatively and 8 are dying with the disease. 29 patients are known to have died of malignancy. 16 could not be followed. If we exclude the 16 patients who were not followed in 67 or 61% of the remaining 110 patients the disease was controlled by transurethral resection only and 37 patients (excluding those who died postoperatively) did not respond to this treatment although they were considered operable. Of the 249 patients in this group 74 were treated by transurethral resection followed by deep x-ray therapy. In only 23 of these cases is the disease known to be under control.

To summarize then 367 patients had either papillary tumours or neoplasms which infiltrated the bladder wall but had not penetrated through it. They were treated by trans-

received only x-ray therapy. These are dead of the disease. One had radon seeds implanted transurethrally and is dying of the disease. One had radium implanted suprapubically and still is well. Two had total cystectomy, one with metatarsal implantation into the skin, in the other the metatarsals are implanted in the bowel. They are still well. Two patients died from ureterointestinal anastomosis prior to cystectomy, one died from bilateral pyelostomy before cystectomy.

The type of treatment and the results obtained in the 123 patients with inoperable carcinoma of the bladder is summarized in Table VIII. Note that the transurethral resection is of definite value as palliative therapy in such cases.

TABLE VIII

TREATMENT OF 123 PATIENTS WITH INFILTRATING CARCINOMA OF THE BLADDER WHICH CLINICALLY HAD EXTENDED OUTSIDE THE BLADDER WALL

Treatment	Number treated	Operative deaths	Number controlled	Number not followed	Number improved for a time	Number dead or dying with disease
Transurethral resection	53	7	2	4	35	40
Transurethral resection + x-ray therapy	17			4	5	13
X-ray treatment alone	12				1	12
Radon implant	1					1
Suprapubic fulguration	3	1				3
Partial cystectomy	3				3	3
Ureteral intestinal anastomosis for palliation	3				3	3
Total cystectomy + ureterointestinal anastomosis	2					2
No treatment	29					29
Total cases	123					106

urethral resection only or in conjunction with x-ray therapy. In 220 patients the disease was controlled, 37 could not be followed, 93 are dead or dying of the disease. Seventeen patients died from the operation, an operation mortality of 4.6%.

Of the 249 patients which were definitely infiltrating, but which had not yet spread outside the bladder wall 49 received treatment other than transurethral resection only or with x-ray therapy. Seven received no treatment because they were considered too ill from the complications of the disease. In 13 partial cystectomy was performed. Of these five have the disease under control. Six are either dead or dying of the disease and two died postoperatively. In 16 a suprapubic cystostomy was done with fulguration of the base of the tumour. Of these one is well, two could not be followed, eight are dead or dying of the disease and five died postoperatively. Six

What is the significance of these results? In patients who have tumours papillary (with or without some infiltration) transurethral resection with multiple sittings and through fulguration of the base or bases of the tumour yield good results (Table IX, Figs. 1, 2, 3 and 4). The immediate mortality is low in this series of consecutive unselected cases and the ultimate results are good. Transurethral resection has made possible the rapid accurate removal of papillary tumours and has obviated the necessity of suprapubic fulguration which carries a much higher mortality. Tumours of any size may be removed transurethrally as long as they have not infiltrated deeply into the base or wall of the bladder. On the other hand when extensive infiltration in the bladder wall is present (all adenocarcinomas fall in this category) transurethral resection has little or no value from the point of view of control of the tumour. Thus in this series of

367 patients treated by transurethral resection, in 93 the disease was not controlled, although the tumours seemed to be limited to the bladder and its wall, when examined by cystoscopy, bimanual palpation under anaesthesia, and microscopic examination of tissue. How then can one determine which patients will not respond to transurethral resection therapy and what alternate treatment should be instituted in this group? As I see it, this is the important problem in the treatment of carcinoma of the bladder at the present time.

To determine whether an individual patient will or will not respond to transurethral re-

TABLE IX

TRANSURETHRAL RESECTION IN THE TREATMENT OF 167 PATIENTS WITH PAPILLARY CARCINOMA OF THE BLADDER AND 200 PATIENTS WITH INFILTRATING CARCINOMA CONFINED WITHIN THE BLADDER

Total patients treated	367
Operative deaths	17
Operative mortality	4.6%
No. of patients controlled	220
No. of patients not followed	37
No. of patients who did not respond to this form of therapy	93

section necessitates a thorough study with cystoscopic examination, bimanual examination under anaesthesia, and microscopic study of the tumour. In most instances such procedures

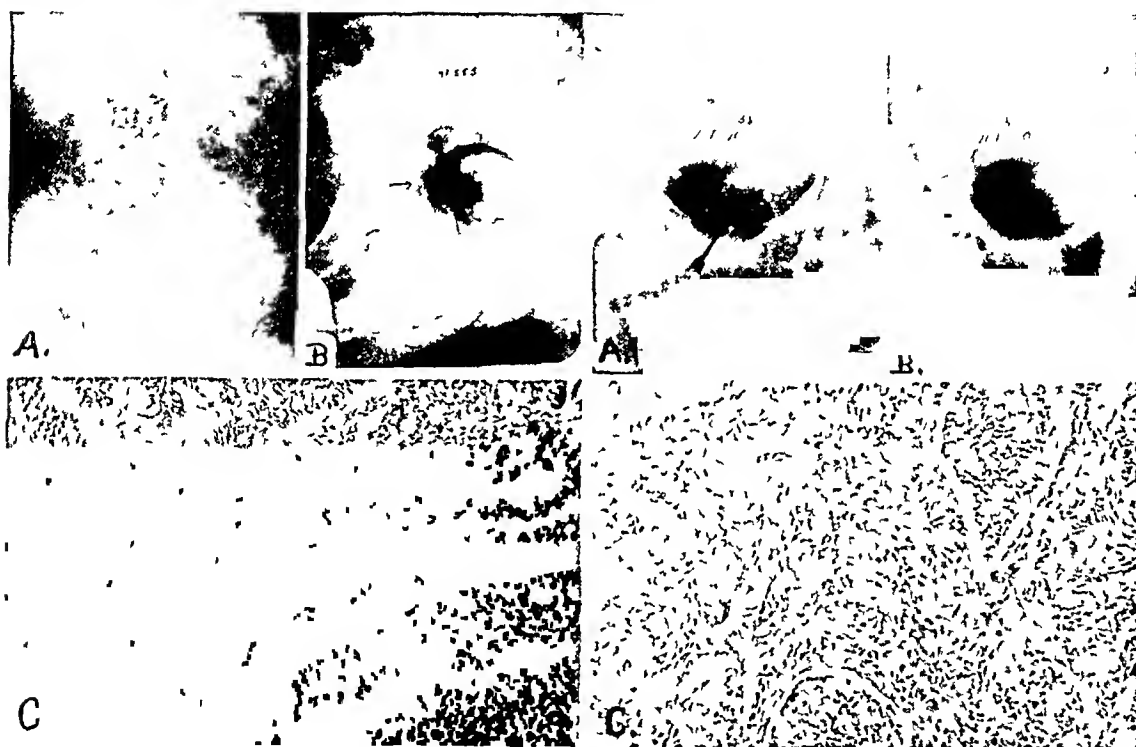


Fig 1

Fig 2

A 49 year old white male entered the University Hospitals August 11, 1945, with a story of symptomless hematuria for one and one half years. Excretory urogram (A) showed normal kidneys and ureters. Cystourethrogram (B) revealed a large tumour of the bladder situated on the right side near the internal urethral orifice. Cystoscopic examination revealed three separate tumours, one on the trigone near the right ureteral orifice with a base 2 cm in diameter, another about 2 cm in diameter on the right lateral wall and invading the prostate, and a third, which was flat and infiltrating, involving the prostate anteriorly. On August 13, transurethral resection of the tumours and thorough fulguration of the bases was performed. The pathological report (C) was papillary carcinoma of the bladder. Check up cystoscopic examination on October 15, and again January, 1946, and April, 1946, revealed a well healed bladder neck. Total cystectomy was not needed in this case. Fig 2—A 79 year old white female was admitted to the University Hospitals on January 18, 1938, complaining of hematuria, urgency and asthma for many years. Intravenous pyelograms showed some dilatation on the right side with fair function. The left kidney showed very poor function with marked ureteral dilatation. Air cystograms (A and B) showed a bladder tumour 6.5 by 4.5 cm attached to the left lateral wall. On January 21, 1938, we removed transurethrally 360 gm of tissue. On January 27, 1938, 80 more grams of tissue were removed. No x-ray therapy was given because the patient was too old and in too poor condition to stand a complete course. Definite induration could be palpated per vaginam. The pathological report on the tissue removed was transitional cell carcinoma of the bladder of the medullary type (C). Check up examination in April, 1946, was negative for any recurrent or new tumour.

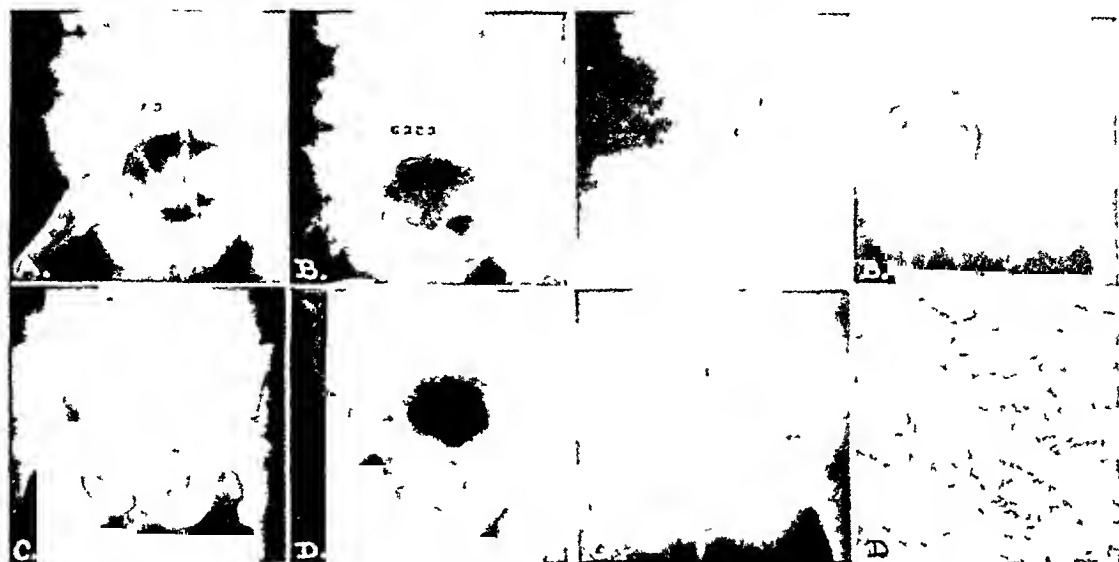


Fig 3

Fig 4

Fig 3—(A and B) Cystogram and cystourethrogram of a patient with a very large papillary carcinoma of the bladder. On March 17, 1943, 820 gm of tissue were removed transurethraally and the base of the tumour coagulated. Good result when last checked in April, 1946. (B and C) Cystogram illustrating the bladder following the removal of 2120 gm of tumour tissue in a patient with multiple large papillary carcinomas of the bladder. Good result. These cases illustrate that size in itself is no contra-indication to the use of transurethral surgery. However, if the tumour penetrates quite deeply through the bladder wall open surgery is definitely indicated. Fig 4—A 56 year old white female admitted to the University Hospitals, February 10, 1941, with a story of bladder irritation and intermittent gross haematuria of four months' duration. Intravenous pyelograms (A) show good function with little dilatation of the ureter. The kidney pelvis are not dilated. Cystograms (B and C) show a very extensive papillary type of tumour involving practically the entire bladder more extensive on the left side and at the base. Cystoscopic examination showed a very extensive papillary carcinoma of the bladder. On pelvic examination there was some evidence of induration about the base of the bladder. Transurethral resection of the tumours with fulguration of their bases was performed on February 19, 1941, 750 grams of tissue were removed and again on February 25 and March 8, with 650 more grams of tissue being removed. Following this deep x-ray therapy (16,200 roentgens), was given. She stood the procedures nicely and left the hospital on May 7, 1941, in good condition. Check up examination in April 1946, showed no evidence of recurrence. No new tumours have formed. The pathological report upon the tissue (D) was transitional cell carcinoma of the bladder.

will reveal the answer. All adenocarcinomas and all tumours with extensive infiltration, definable by cystoscopic examination or palpation, will not respond to transurethral therapy. In the borderline situation through transurethral resection of the tumours is performed. The patient is permitted to return home and a thorough re-examination is performed in between two and two and one-half months. If there has not been great improvement in the condition further transurethral resection is abandoned and other therapy is instituted. The patient is then considered as belonging to the group in which good results cannot be expected by such therapy. Deep x-ray irradiation only, in our hands has been unsatisfactory and therefore three types of therapy must be considered in the treatment of patients of this group: much more extensive irradiation, extensive surgery, or a combination of these two.

I have had too little experience with more extensive irradiation to be able to give an opinion with regard to its value in the cases under discussion. In our experience deep x-ray therapy is not of value in these cases. Its efficacy in conjunction with extensive surgery would make an interesting comparison with the results of surgery alone.

Partial cystectomy has definite limitations (Table X). The cardinal principle in the surgery of carcinoma is wide excision and unless the tumour is located very favourably this is

TABLE X

PARTIAL CYSTECTOMY IN THE TREATMENT OF CARCINOMA OF BLADDER

Total patients treated	16
Operative deaths	2
Operative mortality	12.5%
No. of patients controlled	5
No. of patients dead or dying with disease	9



Fig 5

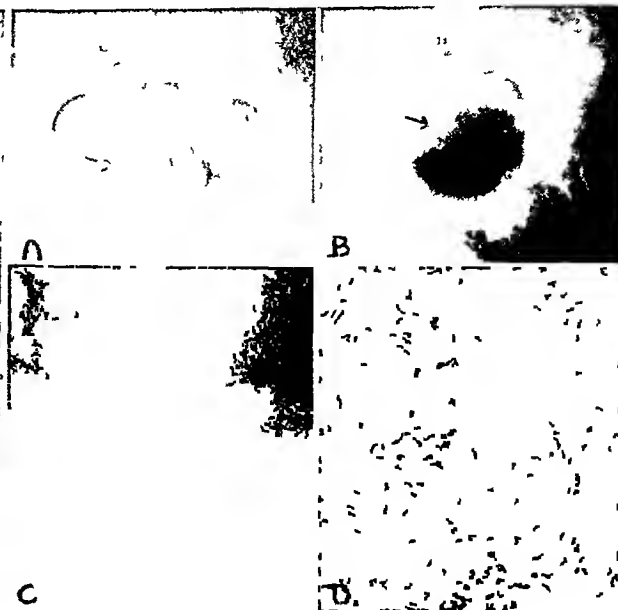


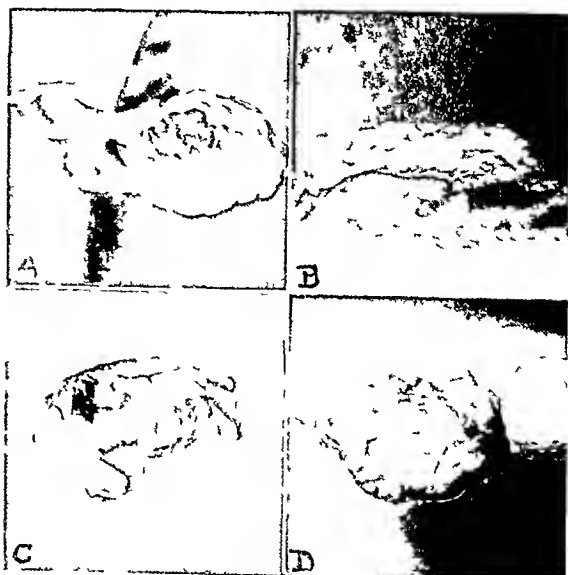
Fig 6

Fig 5—A 65 year old white male admitted to the University Hospitals on November 14, 1939, complaining of intermittent gross hematuria of five years' duration. Cystograms and cystomethegrams (A and B) show a filling defect about the size of a golf ball on the anterior surface of the bladder well away from the internal urethral orifice. Cystoscopic examination on November 16, 1939, showed a tumour of the bladder involving the anterior bladder wall. Its base was 5 cm in diameter and there was a good deal of induration and infiltration present. On November 20, 1939, partial cystectomy was done. The gross appearance of the tumour is illustrated in C and D. The pathological diagnosis upon the tissue removed was adenocarcinoma of the bladder. At the present check up, April, 1946, there is no evidence of any new or recurrence of old tumour. In this case, because of the induration and the character of the tumour, total removal of the tumour—open surgery—was necessary. Since it was so located that it could be removed with a wide margin, partial cystectomy was the procedure of choice. Fig 6—A 63 year old white female was admitted to the University Hospitals May 14, 1940, complaining of gross hematuria of ten days' duration. Cystogram (A and B) showed evidence of a rather flat tumour located on the left interior wall of the bladder. The intravenous pyelograms (C) showed a normal upper urinary tract. On May 20, 1940, partial cystectomy was performed. The tumour was found to be a flat infiltrating carcinoma with some necrosis of the surface. The wound was healed by June 11, 1940, and following this a course of deep x-ray was given. The total roentgens given to the tumour was 14,400. The pathological report upon the tissue obtained was epidermoid carcinoma of the bladder (D). In April 1946 the patient is alive and well and there is no evidence of new tumour or recurrence of the old.

not possible by means of partial cystectomy (Figs 5, 6 and 7). This is attested by the reports in the literature and by our own results in a series of 13 patients, in which the disease could be controlled in only five. In the entire series, only 13 patients were considered suitable for partial cystectomy.

The other alternative, as far as open surgery is concerned, is total cystectomy (Figs 8, 9

Fig 7—A and B show the gross specimen in a patient who had an infiltrating carcinoma of the bladder so situated that it could be removed with a wide margin. Contrast this with C and D. Here a flat, infiltrating carcinoma of the bladder involving the right ureteral orifice was seen. Partial cystectomy was performed but the margin about the tumour even after transplantation of the right ureter elsewhere into the bladder, is so small that the chances for recurrence are good. In such a case more radical open surgery (total cystectomy) should be performed.



and 100. In the evaluation of this procedure the mortality associated with transplantation of the ureters either to the skin or to the bowel prior to total cystectomy and the mortality of total cystectomy in a group of patients in this age period must be considered. In order to make such a procedure popular and useful transplantation of the ureters to the bowel rather than to the skin followed by total cystectomy must be performed with a low mortality. If such a procedure can be carried out most of these patients may be subjected to

this procedure early enough so that it can be expected to have a degree of percentage success in which the disease is involved. The experience during the period covered by the cases in this series has perhaps a great value as candidates for this procedure. Three of them died before total cystectomy could be carried out. Of these three two died following ureterointestinal anastomosis and one following bilateral pyelostomy. In the other two patients total cystectomy was carried out with good results.

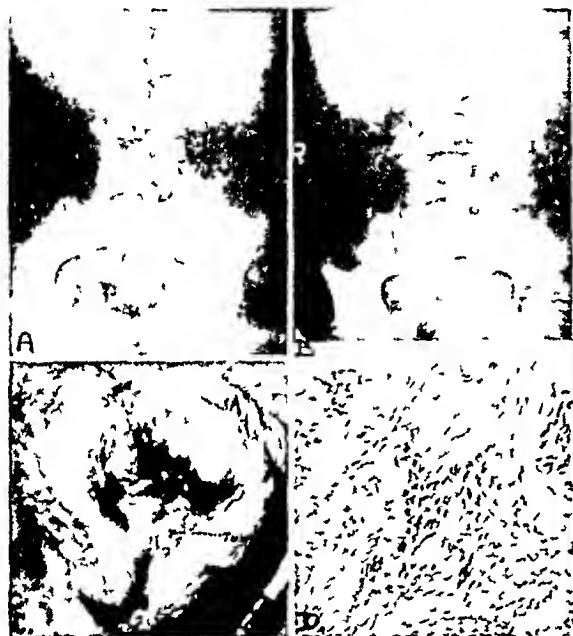


Fig 8

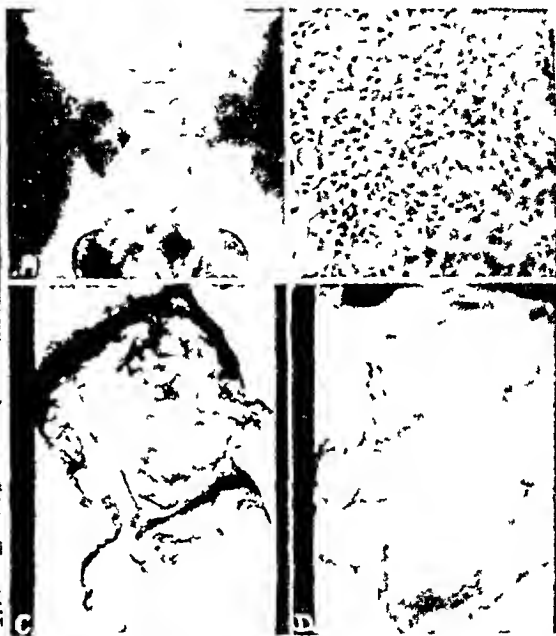


Fig 9

Fig 8—A 49 year old white male was admitted to the University Hospitals on March 2 1941 complaining of bladder irritation gross hematuria of one year's duration. Excretory urogram showed no function on the left side and a filling defect in the excretory cystogram in the left lateral wall of the bladder. Cystoscopic examination showed a large infiltrating carcinoma of the bladder involving the left lateral wall and also the bladder neck. Rectal examination showed definite infiltration around the base of the bladder on the left side. Transurethral resection was performed on March 2 and thorough fulguration of the base of the tumour followed this. On April 5 check up examination showed that although the excretory urogram (A) showed function on the left side with no dilatation of the ureter or kidney pelvis there was still much evidence of carcinoma with a good deal of induration. Locally there had been very little improvement as the result of the transurethral resection and fulguration of the tumour. Total cystectomy was therefore indicated. On April 9 a bilateral ureteral intestinal anastomosis was performed by a method similar to Jewett's. On May 25 a total cystectomy was performed and at that time the communication between the ureter and the bowel was made so that a side to side anastomosis was performed similar to that described in the method of Jewett. Check up pyelograms nine months after the bilateral transplantation of the ureters illustrated in (B). Note how little dilatation and what good function is present in both kidneys following side to side ureteral intestinal anastomosis in two stages as performed by a method similar to that of Jewett's. In June 1945 the patient is seen again with a definite growth in the shaft of the penis. Deep x-ray therapy was applied to this. The patient has not been seen since that time. Fig 9—A 55 year old white female admitted to the University Hospitals on June 7 1949 complaining of increasing frequency of urination and bladder irritation for six years. Excretory urograms are normal. Cystoscopic examination on June 7 showed a severe inflammation with many lesions on the right side of the bladder suggestive of carcinoma. Transurethral resection of these areas was done on June 15. Microscopic study (B) showed infiltrating transitional cell carcinoma of the bladder. This did not respond to intensive transurethral resection so on November 29 after a previous bilateral cutaneous ureterostomy a total cystectomy and urethrectomy was performed. She did well for eight months and then died suddenly of coronary occlusion. Postmortem examination showed the kidneys to be essentially normal and there was no evidence of tumour anywhere. (A) shows the pyelograms after the ureterostomy and (C and D) show the gross appearance of the bladder when it was removed.

The surgical problem is the diversion of the urine. The intrinsic mortality of total cystectomy itself is small. The mortality depends on the results obtained following diversion of the urine and this procedure ordinarily is associated with great hazard. In another report (to be published) the author describes a new method of ureterointestinal anastomosis prior to total cystectomy for carcinoma of the bladder. This method is simple and in eight patients there were no deaths and little urinary tract infection. The operation has the following advantages: (a) by the use of the intact ureter the blood supply to the region of the



Fig 10—The bladder following total cystectomy and ureterointestinal anastomosis in one stage. Note that tumour has extended into the prevesical structures. This means that the lesion is inoperable. The patient developed evident local recurrence five months after total cystectomy and died seven months after total cystectomy of this. No tumour was present except locally. If total cystectomy is to be useful it must be done early—before extension beyond the bladder and its wall has taken place.

anastomosis is maintained, (b) by immediately creating an anastomosis around a ureteral catheter the danger of ureteral obstruction due to surgical oedema or kinking is avoided, and (c), since the anastomosis is made in the first stage no second operation of great magnitude is necessary. It makes possible radical surgery in the treatment of carcinoma of the bladder at an earlier stage. It is the author's opinion that ureterointestinal anastomosis by such means followed by total cystectomy is indicated in those patients who are not suitable for transurethral surgery or partial cystectomy and whose lesions are still confined to the bladder wall.

SUMMARY

A study of 540 patients with carcinoma of the bladder emphasizes the following:

- 1 Earlier diagnosis should lead to control of the disease in a greater percentage of cases.
- 2 Bladder irritation in addition to hæma-

turia, is an important symptom of carcinoma of the bladder.

3 To determine whether an individual patient will or will not respond satisfactorily to transurethral resection of the carcinoma necessitates a thorough study with cystoscopic examination, bimanual examination under anaesthesia, microscopic study of the tumour, and in some cases a study of the response to transurethral therapy.

4 Transurethral surgery is an excellent method of treatment in approximately 50% of patients with carcinoma of the bladder.

5 In the remaining half of the patients more radical surgery and irradiation therapy is necessary if the disease is to be controlled in a greater number.

COMBINED USE OF SODIUM PENTOTHAL, INTOCOSTRIN (CURARE) NITROUS OXIDE

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AS yet we have no one perfect anæsthetic. Each has its own virtues. Each has a talent for producing certain effects beautifully and efficiently. Each is either incapable of producing certain desired effects or produces them only at the expense of large doses, which are actually overdoses in certain other respects. Several of our best and most serviceable agents have undesirable physical or chemical properties which tend to limit their usefulness, especially if we need to use them in certain concentrations or dosages.

The outstanding advantage we have attained in the last very few years in the administration of anæsthetics is the opportunity to select a combination of different agents and to use each one for the production of the effect for which it is best suited and most proficient.

The purpose of this paper is to emphasize the advantage of using together three agents, each of which has certain outstanding proficiencies but each of which, used alone, is incapable

* Read before the Section of Anæsthesiology of the Canadian Medical Association at Banff, Alberta, Canada, June 12, 1946.

of producing truly efficient anaesthesia and of providing at the same time an optimum in safety and recovery.

Pentothal sodium is probably the best hypnotic we have ever had. No other produces sleep so rapidly and pleasantly or allows more pleasant awakening. For a very few minutes, after the initial sleep producing dose, it seems to effect far muscular relaxation such as that needed for reducing a fracture or dilating the anal sphincter. It does not, however, block pain pathways or either the afferent or efferent portions of the reflex pathways with any efficiency. Therefore with any ordinary sleep producing dose, the patient shows great muscular activity when stimulated. A dose sufficient to stop severe skin stimuli, or to bring about plane three of stage three and thus produce fine muscular relaxation, produces profound depression of the cerebrum and medulla. After such doses, as Lundy has continued to emphasize for more than ten years, the effect of pentothal sodium is not short or without depression, but closely approaches the duration and depression of similar doses of pentobarbital sodium. The patient tends to sleep for hours; depression lasts still longer, the tendency toward atelectasis and other complications is increased.

Nitrous oxide is a very weak anæsthetic. It is, however, at least a moderately good analgesic. Anyone who has sat in a dental chair and manipulated a self-administering nitrous oxide analgesia machine knows that while still able to talk with fair coordination and to see the dentist's face and understand his words, one feels no pain when probes are struck into his gums. Seventy per cent nitrous oxide with 30% oxygen will in most people maintain at least a borderline of unconsciousness and a fairly high degree of analgesia. With no higher concentration than this, unconsciousness is usually slow in coming on and in some people is impossible to attain. With this concentration however, after unconsciousness is achieved afferent pathways are dulled to the point of reducing reflex activity. If pentothal sodium is administered with it the amount of the latter necessary is considerably reduced.

Thirty per cent oxygen is certainly adequate if the respiration is kept up to a normal minute-volume exchange. Under practically any anaesthesia, depressing enough to be surgically

efficient, the respiratory minute-volume is reduced. I believe that, for the sake of safety and good physiology, any patient under anaesthesia should have the benefit of at least 30% oxygen, until the time comes when apparatus can be provided to keep us informed from minute to minute concerning the physiological efficiency of the patient's respiration.

It is not enough to say that we should provide 30% oxygen with 70% nitrous oxide without considering definitely how one can provide this mixture. One long-used machine is constructed with a mixing chamber device which may be adjusted to deliver indicated percentages of nitrous oxide and oxygen. Let us grant that this device is accurate. There is no provision for delivering any designated quantity or minute-volume of this mixture. There is, however, a device for delivering this mixture at any designated pressure from zero up, so that the selected pressure is maintained in the tubing, lungs and bag. If any gas escapes from the respiratory system, it is immediately replaced by fresh gases in the designated percentages. If no gases are lost by leakage or escape, none are replaced, the same gas is re-breathed over and over, the oxygen is progressively depleted, and its place is immediately refilled instead by the selected mixture of nitrous oxide and oxygen. If there is complete gas escape there is complete replacement in the proportion designated. This does not happen nor is it desired. There is always some degree of re-breathing and depletion and, with the mechanism mentioned above, one cannot know how much leakage and replacement there is and therefore cannot know with any consistency how much oxygen there is at any time in the patient's inspired atmosphere. It is certain it is much depleted and is nowhere near the percentage indicated by the machine.

Other machines meter each gas in terms of minute-volume flow. Granting that these meters are accurate, one can fill the bag with a known percentage and can then continue the flow at any desired minute-volume, and in any desired proportion between gases. The greater the flow, the greater the necessary leak and replacement and the more nearly will the inspired mixture resemble the percentage indicated on the meters. If the flow is very high, such as 4,000 cc per minute each of nitrous oxide and oxygen, the patient will breathe an atmosphere of practically 50% oxygen. If 2,000 cc each, it will result

in only a little under 50%. Let no one think, however that 1,000 cc each or 500 cc each, or 300 cc each, will give the patient that same proportion. There are still too many anaesthetists who are thoughtless enough to think they are delivering a '50-50 mixture' with the meters showing 300 cc each per minute. I have analyzed only the 500 cc each per minute flow enough times to have a close estimate of the resulting inhaled mixtures. Samples from the inhalation tubing show from 28 to 34% of oxygen. I believe this is consistent enough to offer a very serviceable mixture and I recommend it as a useful, effective, staple and economical technique. After a few minutes of this quantity flow, with the escape valve open just enough to prevent distension of the bag, the mixture becomes practically constant and changes very little. There are not too great differences between different patients caused by the differences in metabolic rates. A very high use is made of the carbon dioxide absorber. Carbon dioxide does not accumulate. A minimum of gas escapes to be called wasted, and economy is therefore promoted. One therefore uses the one great advantage of each of the two methods, closed and open—that is, economy and controllability in the closed, and constancy or invariability in the open.

If a lower flow is employed, there is much greater variability between patients in the resulting inspired gas, caused by differences in metabolic rates, and the discrepancy between the metered proportion and the actual proportion respired is much greater.

Both pentothal sodium and nitrous oxide present the great disadvantage of inability to adequately control reflexes and abolish muscle tone.

Curare in the form of the presently available product Intocostim (Squibb) meets this necessity by disconnecting the myoneural junction to whatever degree we desire. Intocostim also appears to effect some higher synapses and possibly some afferent synapses so that it may produce some degree of analgesia. In large doses it produces unconsciousness. These however, are its least efficient actions, requiring larger than reasonable doses. We seek to call upon it for its best and most efficient actions.

Curare is used most frequently by most anaesthetists as an adjunct to cyclopropane anaesthesia. By using it to accomplish muscular relaxation it is possible to reduce the dose

of cyclopropane to a level which will effect by itself only first plane of third stage anaesthesia. This avoids the more depressing and prostrating effects of larger doses which make the post-operative recovery less rapid, spontaneous and pleasant. Much art is needed to adjust the cyclopropane with precision to this lesser effect. Curare destroys all of the usual signs of deeper cyclopropane anaesthesia or, to be more exact, curare produces these signs by its own action and one can no longer depend upon them as an index of the action of the cyclopropane. One sign alone remains which can be of value. The proper dose of curare for abdominal relaxation paralyzes all muscles except the diaphragm. If the dose of cyclopropane is lowered sufficiently to allow afferent impulses to pass from the periphery to the spinal cord, reflexes are manifested by irregular movements of the diaphragm. This sign appears in the margin between the second and third stages. It is apt to inconvenience the surgeon although the abdominal muscles still remain relaxed by the paralyzing effect of the curare. The tendency of a large number of anaesthetists is to positively avoid the possibility of the inconvenience of the diaphragmatic reflex and therefore to push the cyclopropane effect well beyond this point. The result is that in probably most cases almost as much cyclopropane is administered as if no curare accompanied it at all. Cyclopropane and curare are administered by different routes entirely independent of each other. There is no way to make the dose of either one self-limited or to limit either one by the already present effect of the other.

The parallel use of sodium pentothal and curare gives us an opportunity to employ two drugs by the same route, measured by the same means so that they can be administered in proportional quantities, each one thus becoming self-limited or limited by the combined effect of the two. In this way one can positively avoid an overdose or unnecessary dose of either one. Each of these two drugs supplements the other admirably, the one producing unconsciousness more beautifully than any other drug we have ever had, the other producing muscular quietness, absence of reflex response and loss of muscle tone in any degree we desire more beautifully and with less general depressing effect upon the central nervous system than any other drug we have ever had.

I have tried varying proportions of these two drugs. If too much pentothal is administered, the sleep is too prolonged and the remaining depression too great. If too little pentothal is used, the patient has distressing sensations of respiratory difficulty and muscular paralysis during induction and during awakening. Too often prostigmine is then required to end the curare effect after anaesthesia is discontinued. The proportion that has worked most satisfactorily is 10 units of intocostin with each 25 milligrams of sodium pentothal. There are 20 units of intocostin in each c.c. of Squibb's product. The sodium pentothal has customarily been used in 2½% solution. Translated into volume, this proportional administration is 1 c.c. of intocostin to each 2 c.c. of 2½% sodium pentothal. This ratio is administered from the very beginning of induction. 2 c.c. of 2½% sodium pentothal followed by 1 c.c. of intocostin this quantity of both being repeated at short intervals until the patient becomes unconscious. Half of the above quantities is then administered intermittently until the desired plane of anaesthesia is reached. In the meantime, as soon as the patient loses consciousness the anaesthesia mask is applied, the bag having previously been filled with a mixture of 2/3 nitrous oxide and 1/3 oxygen. The flow is then continued at 500 c.c. each of nitrous oxide and oxygen per minute.

As stated above, this quantity and proportion of gas flow provides a constant and continuing oxygen percentage of approximately 30%, varying from 28 to 34%, depending upon the metabolic rate of the patient. The escape valve must be opened just sufficiently to keep the bag from becoming overdistended.

The over-all anaesthesia picture is then as follows. There is a constantly maintained background of rather light nitrous oxide anaesthesia which remains constant throughout the operative period, with an abundance of oxygen. The nitrous oxide anaesthesia is self-limited because there is a constant, but small, escape of oxygen-depleted gas and a constant replacement by the same quantity of constant nitrous oxide oxygen mixture. The nitrous oxide can never become more concentrated than indicated above. After a little while the nitrogen becomes eliminated from the lungs and respiratory circuit because of the continuous escape, and the nitrous oxide

reaches its maximum efficiency in the attained concentration.

Added to this background, the sodium pentothal and the curare are used to increase the anaesthesia and maintain it just at the point needed for the surgery which is to be done, each of these two limiting itself and limiting the other. Intocostin 10 units with pentothal 25 milligrams are added whenever necessary to maintain the desired effect.

This anaesthetic mixture can be used very satisfactorily for any type of surgery. It has seemed to me to be the most universally applicable anaesthesia that I have ever used. For so called minor operations, such as those upon the surface of the body, it provides most pleasant unconsciousness and muscular quietness. The dose required is relatively small and recovery is rapid. If sodium pentothal is used alone or even with nitrous oxide, for such operations, it is the experience of everyone that large doses of sodium pentothal are required to keep the patient from moving, and even moving violently, during a procedure. The curare reduces the dose of sodium pentothal to an utter minimum. Recovery is therefore very rapid. The reaction of most anaesthetists upon hearing of the use of curare in this way for small plastic operations, eye operations and many others is, 'Why in the world use curare? You do not need relaxation.' The advantage is as stated above, easily attained quietness.

In surgery requiring great relaxation, such as biliary surgery, gastric resections, splenectomies, etc., sodium pentothal and curare are added gradually in greater quantities in the same proportion until the needed relaxation is accomplished. In the latter type of surgery, it is found that the repeated small doses may become further and further apart as the end of the operative period draws near. Perfect relaxation can be provided for the closure of the peritonium, after which no more sodium pentothal-curare is needed. The patient then begins to awaken almost the minute that the nitrous oxide mask is removed and, in most cases, within a very few minutes answers questions intelligently. There is practically never any nausea. The patient experiences a rather pleasant, gradual and languid awakening, as after a long and restful sleep following a tiring day.

A very pleasant advantage of this type of anaesthesia is that it involves no inflammable or

explosive substance. The danger of explosion is only between one in 50,000 and one in 100,000, which makes the possibility extremely rare, yet its absence is comforting.

The only disagreeable complication which has been noted is the occurrence of hiccups, especially during upper abdominal manipulation, in perhaps about one in 15 or 20 patients. This has been controlled in some instances by efficient "controlled respiration" by manipulation of the breathing bag. Twice it could only be controlled by the addition of a very small amount of cyclopropane. Increased sodium pentothal-curare did not control it unless enough was given to stop respiration. The hiccups then stopped and respiration was carried on by rhythmic manual bag compression satisfactorily.

The greatest obstacle to the administration of this type of anesthesia is the occasional difficulty in installing the needle in a convenient vein. A number of times the external jugular vein has been used and has proved very satisfactory. Sometimes the arm has been extended on an arm board so that the needle could be available for any readjustment that seemed

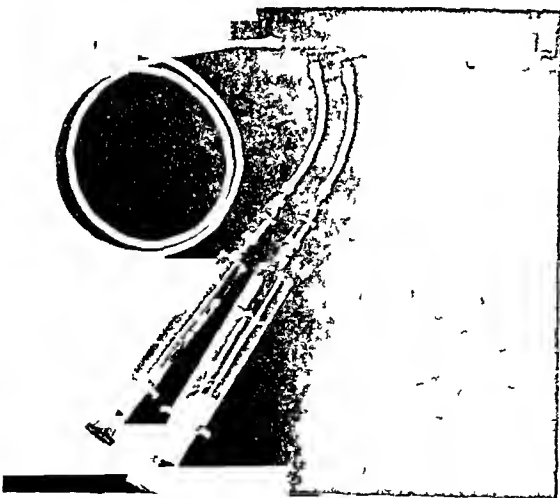


Fig. 1

necessary or helpful during the procedure. This is perhaps the ideal arrangement for the anesthetist but is sometimes inconvenient for the surgeon. Sometimes the needle has been installed in an arm vein either above or at the elbow, or even below, and the arm has then been tucked into the retainer sheet alongside the patient. This is much more convenient and often

even necessary for the surgeon. If this is done one must be very sure that he has used an adequately large needle which is inserted an adequate distance into the vein and is held securely in place, and that the tubing is free from any possible pressure or kinking. One should also be prepared to use a second choice vein elsewhere if any difficulty arises. Sometimes an ankle vein has been used. This is perfectly satisfactory, except that it becomes necessary for the anesthetist to walk to the foot of the table whenever an additional amount of the intravenous anesthetic is needed.

An intratracheal tube has been used with about half of these anesthetics. In each of these cases it has been inserted after the induction with pentothal and curare and one finds adequate relaxation available for this purpose.

The accompanying figure illustrates a very convenient tubing and syringe assembly. The curare and sodium pentothal solutions should be kept entirely separate from each other because they precipitate. Therefore each is introduced into the tubing separately and each is washed down the tubing with a small amount of physiological saline or 5% dextrose or a combination of the two before any of the other is introduced. A length of very small calibre, thick walled tubing is used to connect the needle with the syringes using a sufficient length to reach the anesthetist's stand. A slow drip should be continued between additions of anesthetic to assure the maintenance of an open needle. During induction the drip should be rapid enough to insure prompt movement of each addition of anesthetic into the circulation. The tube with a very small lumen increases the rapidity of this movement into the vein. Many times a blood transfusion has been the medium instead of a solution.

RESUME

Le pentothal procure un sommeil rapide et un relâchement musculaire qui relâche imparfaitement la musculature. Le protoxyde d'azote est plus analgésique que somnifère. La combinaison des deux combine les bons effets de chacun mais n'amène pas encore une relaxation musculaire parfaite. Si l'on y ajoute le curare, nous avons les mêmes bons effets et, de plus, la relaxation musculaire est excellente. Cette méthode emploie le minimum d'anesthésique et est peu toxique, elle est la plus universellement applicable. Les produits utilisés ne sont pas explosifs et ne s'enflamment pas facilement. L'instrumentation et la technique sont décrites.

JEAN SAUCIER

THE USE OF ANTHALLAN IN DERMATOLOGY

By L. P. Ereaux, MD and G. E. Craig, MD

Montreal

HARD pressed paediatricians, allergists and dermatologists in combating allergic disorders are continually shadow-boxing with mysterious allergen opponents. In bouts during the past two decades, laboratory and clinical investigators have endeavoured to promote new products to battle against the "H" substance, and overcome the biological action of histamine. Desensitizing challengers, alteratives, histaminase and the new inactivators, benadryl and peribenzamine in recent preliminary trials as symptomatics have been awarded some rounds on points, but by and large, none have the staying qualities to come through with a clean cut decision against allergy. The fighting tactics of these last histamine antagonists must be carefully scrutinized, for while in action they sometimes exhibit unpleasant atropine-like side effects.

In allergic disorders the inadequate diagnostic methods employed are of necessity paralleled by inadequate specific therapy. Where cure of multiple allergic manifestations is attempted by multiple remedies it is altogether unlikely that any one single remedy will control or cure all conditions. The search for the common denominator to solve the allergic equation still continues, meanwhile the scratcher, the wheezer, the migraine cursed individual and the sneezer keep a watery eye opened and focussed on the research worker for the long awaited remedy.

Newer therapeutic approaches to these disorders are postulated on a possible histamine mechanism causation, but that histamine is the only important factor in these cases has not yet been proved. Encouraging reports by Ghiselin¹ and Tremble² from their use of anthallan in treating vaso-motor rhinitis, and from McKee and Schwarzschild³ in their handling of allergic dermatoses prompted us to attempt a small series of the latter group in our office.

Anthallan is suggested as a blanket type of therapy. It attacks the cause rather than the developed symptoms and is given to patients at the onset of their disorders, before full knowledge of the irritant allergens is known.

By its use are eliminated the tedious scratch and intradermal tests for food and pollen allergies and the otherwise troublesome dietary restrictions and desensitization procedures are thus avoided.

PHARMACOLOGY

Anthallan was developed by Dr. W. S. Loewe of the University of Utah while investigating a new class of synthetic organic compounds the amnized phthalides. Their pharmacological action favourably interrelates with allergic reactions. Anthallan 3'-di(n-butyl) aminomethyl-4, 5, 6-trihydroxy-benzo (1, 2-c)furan-1' (3')-one, $C_{17}H_{25}O_5$, is the lactone of beta-gallic acid ethanol-alpha-di(n-butyl) amine.

Anthallan is a weak organic base poorly soluble in water but soluble in organic solvents and in biological fluids. It is absorbed through the intestinal tract and it is not cumulative in action, as excretion begins in between ten to fifteen minutes, while peak excretion is reached in twelve hours, and it is completely cleared in twenty-four to thirty-four hours. Both Schwarzschild and Ghiselin report investigations which attest to its low toxicity in animal experimentation, and following its administration to humans. "The toxicology data available indicate that the LD₅₀ is over 30 gm per kilogram in cats, guinea pigs and rabbits. Many times the therapeutic dose given daily over periods of one and two years was tolerated by various species of animal without demonstrable changes in general behaviour, growth, body weight, reproduction, blood pictures and blood chemistry and without gross or microscopic anatomical changes in the tissues."³

MODE OF ACTION

The manufacturing chemists state that the experimental study of this drug has so far left the mechanism of its action unexplained. Though it seems to possess weak anti-histamine activity, it has yet to be determined whether the therapeutic effect of anthallan can be explained by such limited anti-histamine action.

This weak anti-histamine action prevents, counteracts and antagonizes the spastic action of histamine. The drug is not a protein and its claims do not include the production of an immune reaction or immunity against disease.

DOSAGE

Individual capsules contain 0.085 gm of the drug and its administration in whole capsule or in powder form makes it an acceptable remedy for the treatment of young infants as well as adults. The elimination of the hypodermic route is appreciated by both patients and parents.

As the drug was found to provoke, in rare instances, gastrointestinal irritation it should always be given after food, and when administered to infants, because of the insolubility in water, it is best given in solids such as apple sauce, honey, etc. Relatively little difference in dosage between children and adults need be considered when employing anthallan.

With our early cases dosages were insufficient and for too short a period, with resultant poorer results. Where we formerly gave $\frac{1}{2}$ capsule to young infants, four times daily, we now give four to six capsules per day and increase to twelve to fifteen in the twenty-four hours. No remarkable change can be expected during the first week to ten days of administration and a maximum daily dose of six for infants and eight to fifteen for children and adults should be maintained for the second and third weeks. We found it advantageous to give smaller daily maintenance doses for a further additional period of from two to three weeks.

CLINICAL OBSERVATIONS

The majority of the cases treated were those of obvious infantile eczema and atopic dermatitis, all of which had previously failed to respond to dietary regimens and the standard topical applications. Cases in which an antecedent history of allergy had been found in one or both of the parents, and where typical sites of election for the disease were found were considered as atopic dermatitis. With adults the obvious psychic types were excluded and in appraisal of results allowances were made for the beneficial effects of hospital environment in the indoor cases.

Anthallan although slow in clearing up the objective dermatological symptoms lessens itching and consequent scratching and avoids the danger of secondary infection. The greater number of cases stated that they received benefit while taking anthallan. Mothers volunteered satisfaction with its results in the treatment of

their infants. The apparent failure to completely remove or clear the skin lesions reflects on the dermatologist, rather than anthallan. To better evaluate its action we usually restricted topical applications to bland ointments. However, combination treatments of anthallan and standard dermatological methods with tar and x-ray gave the quickest results. Combination therapy of benadryl and anthallan were productive of prompt results in relieving itch and aiding sleep. Peck of New York in a recent communication states that for many of his patients on anthallan he gives benadryl in 50 mgm capsules at bedtime to ensure a comfortable and restful night.

The following case history by an R C A M C officer on his own child's progress while on anthallan is submitted. It is typical of the greater majority of cases in our series.

Baby A J H, aged ten months, born prematurely, seven months, weight $23\frac{1}{4}$ lb.

Definite family history of food allergy with skin sensitivity only one brother, age nine, infantile eczema secondary to nuts, fish cod liver oil the father showed sensitivity to fish cod liver oil the mother had a sensitivity to orange.

The baby had a history of severe skin eczema since birth with suspected sensitivity to milk cod liver oil and orange juice. No skin tests were done. At age of six months there had been one severe attack of asthma diagnosed by chest consultant, secondary to orange juice. All new foods, without exception, and increase in all foods caused recurrence of generalized skin eczema.

Anthallan begun at the age of six months two capsules four times daily, caused almost immediate relief from pruritus and skin reaction to new foods or increases. An almost constant nasal mucosal congestion cleared completely and has remained so. However, the eczema has never completely disappeared but is only present in small patches and is asymptomatic for the most part. It is noted that the skin becomes slightly pruritic after each change or increase of food but this is relieved by administration of anthallan. Two attempts have been made to discontinue the drug and have been followed by a quick return of pruritus nervous irritability and eczema. However, the dose has been diminished to one capsule four times a day. The baby's nutrition has steadily increased from beginning of administration of the drug, until the present time when the weight is slightly above average. All systemic developments have progressed normally.

Twelve cases of infantile eczema were followed for the duration of treatment averaging 175 days. While on the drug nine mothers reported marked reduction in itching while eight volunteered that their children were sleeping and eating better and showed less irritability. The primary skin lesions in these patients were unchanged but scratch marks and secondary infection were reduced.

Twelve cases of atopic eczema (disseminated neurodermatitis) were followed for an average of twenty four days and the results here co-

incided closely with the above group. Ten reported marked reduction in itching with improvement in sleeping and eating. Skin lesions did not clear completely but showed fewer excoriations and less secondary infection. One patient in this group complained of mild abdominal distress.

Two cases of toxic eruption were treated one following sulfithiazole and one following penicillin. Both reported rapid relief of symptoms and this was maintained while on the drug. Miscellaneous cases of chronic urticaria, urticaria pigmentosa, pruritus vulvae, seborrheic dermatitis were treated without benefit.

SUMMARY

Anthallan is a safe non-toxic drug which is definitely useful in controlling pruritus and can be counted upon to give relief and comfort to those suffering from allergic dermatoses. Anthallan works best as a complementary type therapy in combination with topical applications, physical agents and even sedatives. Large doses can be administered without particular reference to the age of patients. Side effects are practically non-existent and in rare cases if they do occur they promptly subside by removal of the drug and starting dosage again at a lower level. Prolongation of treatment, higher dosages with smaller maintenance doses following the initial improvement are necessary for best results. Better results are obtained in the very young with acute conditions than with older patients who have more chronic conditions.

In our hands it has been proved an aid, not a cure in handling cases of infantile eczema. A larger series of cases must be investigated and reported before this product can be more widely employed in dermatology.

This study was made possible by supplies of anthallan furnished by the Research Division, Medical Chemical Corporation of America in New York City.

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THE ROLE OF THE GENERAL PRACTITIONER IN THE DIAGNOSIS OF GLAUCOMA

By A. J. Elliot, M.D.

Toronto

THERE are at the present time in Canada 6,777 persons receiving pensions for blindness, this results in an expenditure by the government of over \$2,000,000 per annum for this purpose. In a recent study of the causes of blindness in this country, Aylesworth¹ reported 1,476 individuals blind from glaucoma out of a total blind population of 12,632 people. One in ten of these individuals is blind because of glaucoma. The general practitioner is one of the first to have the opportunity of detecting or at least suspecting the presence of glaucoma at an early stage. He can do this by asking a few relevant questions and including a few simple procedures in his list of diagnostic methods.

It is important for him to know that early medical and surgical care of glaucoma usually is successful and prevents blindness in a large percentage of cases. The same cannot be said for late treatment. Early treatment cannot be started without early diagnosis and it is here that the medical practitioner is in a position to suspect or detect this condition, and direct his patients to eye clinics or ophthalmologists for detailed ophthalmic examinations. It is not a question of converting the general practitioner into an ophthalmic specialist, but of making him glaucoma conscious.

Glaucoma is a pathological condition of the eye which is characterized by an increase in intraocular pressure. When glaucoma is not treated blindness invariably results if the patient lives long enough.

Acute congestive glaucoma—Acute congestive glaucoma has a stormy beginning. It manifests itself by excruciating pain in and around the eye, head, ears or teeth. Sometimes there is nausea or vomiting, and there may also be fever. Such attacks have been diagnosed wrongly as "bilious attacks." The visual acuity rapidly diminishes and the field of vision is considerably

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reduced, mostly on the nasal side. Usually only one eye is affected and it quickly becomes very red. One may feel he is dealing with an acute conjunctivitis or iritis. However, the eyelids are never matted together in acute congestive glaucoma and the eye is always hard. The cornea is cloudy and it is almost insensitive to touch with a small piece of cotton wool. The anterior chamber is shallow, the iris discoloured and the pupil dilated. There is usually a greyish-green reflex in the pupillary area. Immediate action is necessary to save this eye from blindness. A miotic such as eserine 1% or pilocarpine 2% must be instilled every few minutes. At no time must atropine be put into an acutely glaucomatous eye and such ointments as yellow oxide of mercury or metaphen have no therapeutic value. It can be seen that there is nothing insidious about this type of glaucoma.

Chronic non-congestive or simple glaucoma — For every case of acute glaucoma there are ten cases of simple glaucoma. This is a disease of the eye which slowly and without the patient's knowledge, robs him steadily and painlessly of his sight. It is in this type of glaucoma that the medical practitioner's help is needed for its early discovery.

The impairment of vision is usually at first only in one eye. It may occur as early as 40 years of age with an occasional blur in front of one or both eyes. The blurred vision may last several hours and is often accompanied by a slight one-sided headache. Sometimes he may complain of tearing or experience some difficulty in reading. However, the eye is never red. These symptoms often occur at times of excitement, over-indulgence or worry, or after attending the theatre. The vision is often blurred at night and he may see halos around street lights or car lamps, and walking at night is difficult. Sleepless nights accentuate these symptoms.

This dangerously mild course may last months or years before the patient becomes aware of the loss of his central vision. He may have had his glasses changed several times during this period without much improvement in his vision. All this while there is a serious defect developing in his peripheral visual field. No treatment is instituted at this stage and finally impossible to recover lost vision. The problem now is to arrest the process and prevent further loss of vision.

The question then arises as to how the

essential points which will assist him in recognizing or at least suspecting glaucoma?

First, he must measure the visual acuity with a Snellen chart with and without the patient's glasses. Any case of subnormal vision in one or both eyes must always be investigated further.

Second, he must ask the patient about the occasional occurrence of blurring or clouding of vision, of seeing rings around distant lights or one-sided headache, or discomfort in and around the eyes after attending theatres, excitement or worry.

Third, he must feel with his fingers whether the eyes are normally soft or abnormally hard. One can easily acquire the sense of the normal tension of the eyeball.

Fourth, he must examine the size of the pupils and their reaction to light. Inequality of the pupils or poor reaction to light must be checked further.

Fifth, he should examine each eye with the ophthalmoscope noting whether there is any pallor of the optic discs and any excavation. The technique of using the ophthalmoscope is not difficult and one is soon able to acquire sufficient skill to be able to see the optic discs in a majority of patients.

Sixth, he should inquire if there is a history of glaucoma in the family.

These six points will enable the general practitioner to suspect or even detect a case of glaucoma. Having done so he should then direct his patient to an eye clinic or to an eye physician for more detailed ophthalmic examination and appropriate treatment. Above all the practitioner should exercise great tact so as not to alarm the patient unduly until the diagnosis of glaucoma is confirmed. Once the diagnosis is established the patient will remain a glaucoma patient with all that this entails, for the rest of his life.

In conclusion, the general practitioner should remember that every glaucoma patient is a candidate for partial or total loss of sight. He should remember also that this blindness from glaucoma is frequently preventable. He should know that prevention of blindness from glaucoma is often attainable by early diagnosis, early treatment and constant watchfulness. On the other hand late diagnosis and late treatment in the majority of cases mean failure.

SURGICAL TREATMENT OF CANCER OF THE LARYNX

By Howard McCart, M B

Toronto

A REVIEW of the Ontario vital statistics for cancer of the larynx over a period of 13 years shows that there is a very marked apparent increase in laryngeal cancer. Laryngeal cancer deaths in Ontario 1931 to 1936, 184 deaths or 30.6 per year, 1937 to 1943, 302 deaths or 43.1 per year.

In other words there is nearly 45% increase in the number of laryngeal cancer deaths in the last seven years, whereas in the same period of time, there is only an approximate 11% increase in our population.

This increase in cancer deaths can be accounted for by more reliable statistical information, improved medical diagnostic methods. The other factor is that more people survive and reach the age when cancer is more prevalent. Cancer of the larynx, like all cancer, is on the apparent increase, though it is a rare manifestation, varying from 1.8% in England to 5% in America, as compared with the occurrence in other parts of the body.

Great advances have been made in the treatment or cure of cancer since Bilroth in 1873 reported the loss of his first 20 patients following laryngectomy. Since that time the names of St. Clair Thompson, Mackenty, Orton and Jackson, to mention only a few, stand out in their contribution towards the successful surgical treatment of properly chosen cases.

Before deciding on the type of surgical treatment, one must remember that cancer of the larynx is arbitrarily divided into three classes: (a) intrinsic, (b) extrinsic, (c) subglottic. Bearing this classification in mind as to site,

much knowledge can be gained as to the rate of growth, spread of metastasis, and the appropriate type of surgical treatment.

Intrinsic cancer of the larynx is more common than extrinsic, and nine to ten times more common in men than in women. It arises in the interior of the larynx, the vocal cord is, early the most common site, especially in its

On the—
From the Department of Otolaryngology of the University of Toronto and the Toronto General Hospital. Read at the Seventy seventh Annual Meeting of the Canadian Medical Association, Section of Otolaryngology, Banff, Alberta, June 12, 1946.

central or anterior half, and rarely does it arise in the ventricular bands, sinus of Morgagni, interarytenoid region or posterior third of the cord. It is relatively benign in character as a rule grows slowly, only invading the cervical glands in the advanced stages.

The intrinsic type originates about the orifice of the larynx, on its pharyngeal surface. It includes neoplasms arising from the epiglottis, aryepiglottic folds, the arytenoid cartilages, the pyriform sinuses and the post-cricoid region. The latter is the only type of laryngeal cancer more common in the female. The disease when situated extrinsically, is more malignant and invades the cervical glands at an early stage.

Neoplasms of the subglottic region are difficult to diagnose in the early stage. They arise on the inner surface or under surface of the cord or the subglottic area. They have a large amount of lymphatic drainage and possibly early metastasis between the oesophagus and trachea.

The occurrence as to site in the present group of cases is as follows: total number of cases 23, of which 15 were intrinsic, 4 extrinsic, and 4 subglottic.

While the surgical technique has greatly progressed in the past twenty-five years, all too little progress has been made in the early diagnosis of the disease. This is due to carelessness by the patient and lack of appreciation of the physician in recognizing that recurrent or persistent hoarseness is the one and only early sign of cancer of the larynx and is of serious consequence. This is more especially true in a patient over forty-five years of age, thus one cannot stress too greatly that a skilled opinion should be obtained as to the cause of the hoarseness. Jackson stated that every adult with hoarseness should be considered possibly cancerous until proved otherwise. On the other hand the site of the growth leaves something to be desired in that early diagnosis of the subglottic type does not produce symptoms until the cord is invaded.

The early symptoms of the extrinsic type are at variance, in that the earliest symptoms may be a tickling sensation or a constant clearing of the throat. A persistent abnormal sensation in this region should warn the physician that he may be dealing with a potential malignant growth.

The earliest laryngeal appearance may be dimpling, fungation or infiltration. A tiny wart or papilla like growth or ulcer on the middle or anterior third of the vocal cord in a patient of the cancer age must always be regarded at least as precancerous. Ulceration may occur early or late, in certain cases the surface of the cord may appear granular or roughened, with a whitish exudate which may be discrete or confluent.

In all cases one should always keep in mind and exclude tuberculosis and syphilis, as tuberculosis is more often mistaken for cancer than any other condition. On the other hand tuberculosis and syphilis may also be present.

Any impaired mobility of a cord which shows ulceration or induration should certainly be regarded, not as an early symptom of cancer of the larynx, but as a late symptom. Direct laryngoscopy should be performed in all cases where malignancy is suspected and a section of any suspicious area taken for pathological diagnosis. Direct examination should never supersede clinical examination as the microscope is by no means infallible and repeated biopsies may be necessary.

In the American literature Broder's classification as to degree of malignancy is considered of great value. This classification divides cancer into four groups depending on the differentiation of cells. This is a very arbitrary classification, and different pathologists will frequently give different opinions on the same section. For this reason one should not rely too much on this classification but rather be content if the section is positive for cancer and whether or not it is a rapidly or slow growing type of neoplasm.

Having made the diagnosis of cancer the surgeon must decide whether a laryngo-fissure will remove the disease or a total laryngectomy is necessary.

Laryngo-fissure is contraindicated if the growth has extended across the anterior commissure, if there is impaired mobility of the cord or if the growth has extended subglottically. It is conceded, as Thompson states that lasting cures can be obtained in 50% of cases where growth has not extended past the midline and where there is no lack of mobility, in cases where there is lack of mobility the percentage of cures is as low as 44%. As will be shown later, our difficulty has been in getting cases early

enough so that laryngo-fissure may be carried out.

All carcinomatous lesions within the larynx, other than the ones as stated above should have total laryngectomy. Certain early extrinsic cases in which the neoplasm arises from the epiglottis, aryepiglottic folds, pyriform sinuses or pharyngeal surface of the cricoid may also be suitable for total laryngectomy. They cause chiefly pharyngeal symptoms, are easier to recognize, the glands are invaded early or may even be the first sign to attract attention.

OPERATIVE TECHNIQUE

The surgeon, having made his decision as to laryngo-fissure or total laryngectomy, should have the patient carefully examined medically. Special emphasis should be placed on mouth hygiene and any dental caries eliminated. Sulfadiazine gr. x q. i. h., is given for two days previous to operation and continued in varying amounts depending on the blood level, this is now replaced by penicillin intramuscularly 120,000 units per day, how long it is continued depending on the condition of the wound.

Laryngo-fissure may be carried out under local or general anesthesia though I prefer general. Morphine heroin and hyosine before and after operation should be avoided as they do not allow for a prompt return of the cough reflex. The operation is performed most safely with tracheotomy done at the time of the operation and the tube removed twelve hours after operation. It is the chief means of securing the greatest possible protection against the one great danger of laryngo-fissure viz, haemorrhage during or after operation which in turn leads to pneumonia and is the principal cause of death. The airway above the cannula is carefully packed with ribbon gauze introduced through the slit of the thyroid cartilage, thereby preventing any food or secretions getting into the trachea.

A straight vertical midline incision is made from thyroid notch to below the level of the cricoid cartilage. The thyroid cricoid and first three rings of the trachea are exposed, haemostasis accomplished, isthmus of the gland and edges over-sown with chromic catgut. Tracheotomy is performed. The thyroid cartilage is divided by laryngeal scissors or if the cartilage is soft, with scalpel. The perichondrium is raised intact from the cartilage and a major portion of the thyroid on the affected side removed. The internal perichondrium is carefully inspected to see if the growth has extended past the anterior commissure. When the perichondrium is opened I feel it is safer to section vertically on the non-involved cord and ventricle beyond the growth so that careful inspection permits one to decide on extent of the excision necessary. The involved cord and ventricle are removed with curved scissors as posteriorly as to include the vocal process. The pyriform above the tracheotomy cannula is removed. No sutures are put in the perichondrium or cartilages, the fat and muscular layers closed with buried sutures, and skin with horsehair, and an appropriate dressing applied. The patient is returned to bed in a semi-recumbent position, the tracheotomy tube sucked occasionally if patient has any difficulty in expelling any mucus blood. Sips of sterile water are given for the first twenty-four hours, after which solid diet is given. It is only rarely that a feeding tube is necessary. Penicillin is given intramuscularly, 120,000 units in two four hour doses and the patient allowed up the day following operation.

The operative mortality should not be greater than that incidental to any operation, and

well selected cases, recurrences should not be more than 20% and as such are shown in the form of a local recurrence

LARYNGECTOMY

It is only in the past three decades that this operation has rightfully passed into the hands of the laryngologists. The early operative results were disastrous, the mortality being as high as 74%. The improved mortality rate in the past twenty-five years is most striking as shown by the following table

TABLE I

	No of operations	Immediate mortality	%
MacKenzie	230	3	1.3
Bruton	99	5	5.0
Colledge	42	3	7.0
McCall	43	0	
Jackson	70	0	
McCall	25	0	
Present series	23	0	

Failures following operation are due to metastasis in the regional lymph glands. Five cures should be obtained in 65% of cases. Laryngeotomy is indicated for advanced cases of intrinsic cancer of the larynx, in to alized growth with impaired mobility of the cord or where there is extension into the ventricle (subglottic region). If the disease has originated in the arytenoids, aryepiglottic folds, epiglottic sinus, or post cricoid region to a moderate degree, laryngeotomy should be performed. If regional cervical glands are involved, Jaeger should be removed and the patient given chemotherapy.

The choice of anaesthesia is important. I prefer cyclopropane or pentothal. Tracheotomy is preferred preferably to the time of operation unless there is dyspnoea. A blood transfusion of 500 cc may be given at the time of operation followed by 5% glucose intravenously with penicillin.

A vertical or T incision is made. I prefer the T incision as it gives a better exposure. The horizontal part of the T is made at the level of the hyoid bone extending from the anterior border of one sternohyoid muscle to the other, the vertical incision from the centre of the hyoid bone to the suprasternal notch. The skin flaps are dissected backward and all superficial vessels ligated. The superficial cervical fascia is divided along the midline. The attachment of the sternohyoid muscles are divided from the hyoid bone, and likewise the attachment of the sterno thyroid and thyroid hyoid muscle from the thyroid cartilages. Following this, the isthmus of the thyroid, if high, is divided between silk clamps and oversewn with chromic catgut, the trachea and being separated from the trachea. The superior and inferior arteries and veins are exposed and ligated,

being generally found entering the thyroid gland membrane just above the edge of the thyroid cartilage and a little anterior to the cornua. The larynx is then rotated to bring the posterior border of the thyroid cartilage into view and the inferior constrictor muscles are cut along this border. The trachea is now everted above the first tracheal ring and anchored to the skin for future use. A gauze pack is inserted into the larynx to prevent leakage from the mouth into the wound. The intubation tracheal tube having been removed by the anaesthetist is now replaced by a short rubber tube (piece of McGill tube about 3" in length is satisfactory) inserted in the trachea and surrounded firmly with gauze packing, the anaesthetic being continued through this tube. The larynx is now dissected from below upwards from the oesophagus, the pharynx opened through the thyrohyoid membrane having first removed the hyoid bone by careful dissection to allow a better pharyngeal closure, but more important, that a complete removal of the epiglottic or Boyer's space is more easily accomplished, as lesions involving the epiglottis, ventricle or ventricular bands readily extend into this space. A large gauze pack is inserted into the pharynx to be withdrawn later through the mouth by the anaesthetist after operation. Following removal of the larynx the pharyngeal opening is closed with interrupted linen sutures on round needle. Just before the last few sutures are tied, the packing is removed from the mouth, a feeding tube is passed through the nostril and guided down the oesophagus. The remaining sutures are tied and interrupted chromic gut sutures are placed in the oesophagus. A third layer of sutures is placed in the constrictor muscles of the pharynx. The trachea is anchored to the skin with silk worm suture over buttons or small pieces of gauze to relieve tension, and can be removed in forty-eight hours. The suturing of the tracheal stump to the skin is now completed with horse hair sutures. The sternohyoid muscles are then brought to the area behind and above the trachea making four lines of sutures over the pharyngeal opening. Contra drains of Penrose tubing are now inserted at the outer ends of the horizontal incision and two just above the trachea and brought out lateral to midline through stab wounds in the skin. The skin is brought together with horsehair sutures, having first filled the wound with sulfadiazine and penicillin powder.

At the end of the operation the trachea is sucked out and a tracheotomy tube inserted, having been wound with narrow tape so as to fit the trachea tightly and a rubber sheet fitted around the canula to prevent wetting by tracheal secretions. A tulle gras dressing is placed over the incision and an appropriate dressing applied.

The patient is returned to a warmed room. The Gatch frame inclined about 30 degrees the air in the room is constantly humidified and a layer of moistened gauze laid over the tracheotomy tube. The tracheal secretions are frequently aspirated by a suction pump which is kept at the patient's bedside constantly, as are the mouth secretions. The inner tube of the tracheotomy canula is cleared three times daily.

Morphine or codeine should not be given although nembutal gr 1/2 to 3 per rectum may be given if necessary.

The intravenous of 5% glucose is discontinued the day following the operation the patient allowed out of bed, and penicillin now given

intramuscularly. A high caloric diet is given through the feeding tube consisting of strained fruit juices, milk, egg-nog, etc., of which three to five ounces are given every two hours. The amount of diet is gradually increased to provide an adequate caloric diet. A 25% alcohol mouth wash should be used several times daily.

The dressing tube must be changed daily, and only by the surgeon himself, a fresh tracheotomy tube, having been wound with gauze, inserted on the fourth day and changed daily thereafter. The retention sutures may be removed in four days, the drainage tubes in four to five days and the skin sutures in seven to ten days. The feeding tube may be removed as soon as the wound is healed, provided there is no leakage as manifested in allowing the patient to swallow small sips of water alongside the feeding tube.

RESULTS

The series reported consists of 23 cases, operated on between September, 1943 and April, 1946, namely 2 laryngo-fissures, and 21 laryngectomies.

1 All cases showed squamous cell carcinoma on pathological section.

2 There were no immediate deaths. All but two are alive and well. One case died from extensive internal hæmorrhage three weeks after operation, having had very heavy x-ray treatment previous to operation. The second case, a woman, died six months following operation. This patient had some constriction of the œsophagus, returned to hospital for dilatation, and the day following was found dead in bed, apparently from a pulmonary or coronary embolus.

3 Two laryngo-fissures in 23 cases showed a striking carelessness by the patient regarding his disease, and in many cases a lack of appreciation by the physician.

4 The greatest percentage of cases were in the sixth decade. The youngest patient I have seen was in a patient of 20 years, the oldest 81, showing that cancer is no respecter of age.

5 There were three women or 13% in the 23 cases, and all were of the extrinsic type, two being the post epiglottic region, the third on the aryepiglottic fold.

6 Of the 20 laryngectomies in men, 15 were intrinsic.

7 While it is yet too soon to speak of cures, two of the twenty-three cases have died from causes other than cancer itself.

8 All patients have resumed normal occupation, among which are the following, blacksmith, mechanic, salesman, insurance broker, etc.

These patients are greatly assisted in rehabilitation by means of œsophageal speech. This is very important and takes time and patience, is well worth while. I believe that all patients can acquire an œsophageal voice, providing they have the will and the desire, in so doing they will have many worthwhile years of life. He is different from the days of Billroth!

I desire to express my gratitude to Dr. Henry Orth, Newark, N.J., whose stimulating teaching first made me realize the importance of this subject.

TUBERCULOSIS IN THE NAVAL SERVICE FROM 1930 TO 1945 (INCLUSIVE)

By Surg. Lieut. Comdr. G. Jarry,
SBPO A. Richardson and
SBPO W. V. Maynard, WR CNS

IN May, 1943, at the meeting of the Canadian

Medical Association in Toronto, a report was submitted regarding the incidence of tuberculosis in the Naval Service. The conclusion of that report was that the tuberculosis rate was rather low, much lower than that encountered in the civilian population at large. A slight increase was noticed in the latter part of 1944 and it was then surmised that a further increase could be expected in 1944 and 1945.

Where possible, it was proposed to survey the chests of all naval personnel by x-ray annually, but as the war proceeded and personnel were more widely scattered, there were often fairly lengthy intervals between the original examination and the routine check-up. However, stress was laid upon the desirability of such a procedure in small ships where accommodation was limited. At the manning pools, no ratings officers were to take up sea appointments without chest x-rays. Out of these mass surveys several new cases, with no clinical symptoms, were diagnosed.

As indicated in Table II there has been an increase in the rate per 1,000 from a low of 0.1 in 1942 to 1.10 in 1944. For the first half of 1945 it was 2.2 and for the last half 2.9, but doubt this figure has been influenced by the wider surveys made, the persistent hunt for early cases, the general wear and tear of war.

are, and the large scale x-raying which accompanied demobilization. Possibly the figure 0.71 could have been higher had there been available in the earlier part of the war the equipment and trained staff which was obtainable later on. The following tables are self explanatory.

TABLE I

SECURITY EXAMINATIONS AND REJECTIONS, MALE AND FEMALE, FROM SEPTEMBER 1, 1939 TO DECEMBER 31, 1945, INCLUSIVE

Total examinees	114,284
Total rejects, all causes	11,636
Percentage examinees rejected, all causes	10.18
Total rejects, tuberculosis	566
Percentage examinees rejected for tuberculosis	0.49
Percentage rejects rejected for tuberculosis	4.8

TABLE II

Period	Complement at end of period	Number of cases	Rate per 1,000
Oct 1939 to Dec 1941, inclusive	27,614	51	0.85
Jan 1942	49,398	35	0.71
Jan 1943	75,354	65	0.86
Jan 1944	95,609	105	1.10*
Jan 1945 to June 30	99,078	106	2.2
July 1 to Dec 31, 1945	42,359	128	2.9

*Pulmonary only

TABLE III

Occupation by rating	Number of cases	% cases
Female	6	5.1
Sealers	10	8.6
Men, etc	61	52.5
Engine room	15	12.9
Thinks and stewards	6	5.1
Ally and writers	8	6.8
A's	2	1.7
Wentians	8	6.8

TABLE IV

Length of service	Number of cases	% cases
1 month	7	6.0
2 to 24 months	16	13.7
25 to 36 months	30	25.8
37 to 48 months	23	19.8
49 months and over	40	34.4

TABLE V

Length of sea service	Number of cases	% cases
Under 6 months	27	23.2
6 to 12 months	16	13.7
13 to 18 months	25	21.5
19 months and over	8	6.8
	40	34.4

TABLE VI—A

Degree of infection	Number of cases	% cases
Non-pulmonary	3	2.4
Tuberculous pleurisy	5	4.3
Subminimal and minimal	75	64.6
Moderately advanced	26	22.4
Far advanced	7	6.0

TABLE VI—B

Laboratory test results	Number	%
None recorded	12	10.3
Positive sputum and/or gastric lavage	48	41.3
Positive effusion	1	0.8
Mantoux (only) positive	31	26.7
Test negative	24	20.6

TABLE VII

Contact and medical history	Number	%
Negative	80	68.9
Pre-enlistment pleurisy	1	0.8
Pre-enlistment other disease (relevant to infection)	0	0
Family and civilian contacts	22	18.9
Contacts known amongst naval personnel	13	11.2

TABLE VIII

Age at re-categorization	Number of cases	% cases
20 years and under	21	18.1
21 to 25	53	45.6
26 to 30	22	18.9
31 years and over	20	17.2

CONCLUSIONS

- 1 The high rate for 1945 was due to routine and demobilization x-rays
- 2 Overall yearly rate per 1,000 was 2.36

The science of mental hygiene is one of the most important disciplines, concerned with the human mind. It is a science that helps man adjust to his environment and find harmony with his family, his community, and the world. This science of mental hygiene needs to be developed and applied as a basic element in preventing war and destroying the seeds of war—F. H. C. P. (Parron)
J Am M Ass, 131: 1208, 1946

ENURESIS

By C B Stewart, MD

Winnipeg

THE child born into this world with a partial obstructive lesion of the lower urinary tract, which allows evacuation of urine but maintains back pressure above the level of the lesion, has a good chance of being allowed to retain this abnormality until secondary changes are such that a complete urological investigation is demanded.

Particular attention has been given during the past five years to enuresis in adult males and as few organic causes have been found, there is even a greater tendency than before to consider the problem entirely a functional one. Obviously, an individual arriving at adult age in a healthy state has no organic basis for his enuresis. If an organic cause were present, the possibility of reaching that age in good physical condition would be unlikely.

The incidence of organic lesions producing enuresis is low (approximately 1%), but the discovery of one case out of 100 and the removal of the cause of the disability is ample compensation for the thought and time spent in interviewing the others.

In the investigation of an enuretic one must look for (1) irritating causes, (2) endocrine disease, (3) abnormal mental states, (4) neurological lesions, (5) organic causes.

In order to determine into which group a given case falls, a complete history and physical examination are a necessity. Attention should be given to the child's birth and past history, the family history, the treatment carried out so far, the attitude of the parents or guardians to the affliction, and the reaction of the child to his environment. Regarding the urinary system, inquire as to whether enuresis has been continuous from birth or whether there has been an interval of freedom. Is it nocturnal only or diurnal as well? Does the child empty the bladder freely or is there difficulty, straining and a poor stream? Does wetting occur immediately or soon after voluntary urination, or is it at long intervals and when the bladder would ordinarily be

distended? Does it occur every night and more than once a night or only on occasion? Determine if possible whether there is actual a time interval rather than enuresis. At all possible a child should be observed during the act of urination to determine the way with which the bladder is emptied and a test for residual urine done immediately after. Careful examination of the qualitative and quantitative character of the urine is done. An examination is made of the genital area and rectum and in some cases blood studies, basal metabolic rate and x-ray studies of the urinary tract and spine are made.

In the organic group, the history is constant and progressive, and the symptom is present both day and night. Some abnormality noted in the ease with which the child voids there is usually straining, a poor stream, an dribbling. Care in eliciting the history and carrying out the general physical examination can usually determine whether or not an organic lesion is present.

In mental structure, which is sometimes the cause of a definite disability, no difficulty is encountered in the diagnosis. In such case the child will strain during the act of voiding and on physical examination and palpation of the urethra definite dilatation and bulging will be observed.

The urethral valve, while it may only result in maintaining the symptoms of enuresis or produce such a high degree of back pressure that extensive renal damage is inevitable. In this group a definite disturbance in voiding is noted particularly alteration in the force of the stream and dribbling. There is no interval of freedom from enuresis, but instead, the condition tends to become more pronounced. Residual urine of varying amount is encountered and on endoscopic examination the valves are usually bilateral, extending from about the level of the vermiform appendix upward and backward in the direction of the vesical sphincter and the anterior commissure. The prostate utricle is usually found to be enlarged, but this I consider is not significant as it is commonly found in cases of enuresis in the young child. Thickening of the bladder may be present and the condition may have gone on to ureteral dilatation with hydro-ureter, hydronephrosis, and advanced kidney damage. Cystogram will often reveal a funnel shaped

* Read at the Seventy seventh Annual Meeting of the Canadian Medical Association, Section of Urology, Banff, Alberta, June 12, 1946

ladder neck and a dilated bladder, while intravenous urogram will determine the degree of renal function and the presence or absence of ureteral dilatation. The treatment is removal of the obstruction usually by endoscopic resection or fulguration. If adequate treatment is instituted in the early stages, the chronic disabilities that may arise are prevented. However, if the child is allowed to carry on, such extensive changes may occur as one can demonstrate in the following two case reports.

First, H. C., a boy of 10 years when first seen, with a history of enuresis since birth, a blood urea nitrogen of 94 mgm, and a marked secondary anemia, was found to have a bicuspid valve situated at the bladder neck and a residual urine of approximately 10 ounces. Resection and fulguration of these valves resulted in a complete emptying of the bladder and a return to normal function as far as the bladder was concerned, but such was the extent of renal damage produced by the long period of back pressure that he died two years later of renal insufficiency.

The second case is that of a little boy of 7 years, R. M., who also had enuresis since birth and an elevated blood urea nitrogen. Cystogram demonstrated a markedly distended bladder with an efflux up both ureters and a marked hydronephrosis. Intravenous urogram revealed poor visualization with marked dilatation on both sides, the right more advanced than the left. Nephrostomy drainage was established on the right side and a resection of the valves of the posterior urethra resulted in the cessation of the symptoms of enuresis and a marked improvement in his general health. It is three years since this operation was performed and the child still retains the nephrostomy tube in his right kidney.

These are two examples of what may take place as a result of incomplete investigation and the consequent withholding of appropriate treatment. Minor degrees of disability are countered from time to time, and if corrected when a child is young not only render the child and the parents more comfortable and happy, but also may present these later developments. The value of complete investigation where chronic lesions might be encountered is demonstrated in the following case report.

A well-developed child of 4 years of age had had enuresis since birth in a gradually increasing degree. He had difficulty in voiding and marked dribbling following the act. He was found to have 1 1/2 ounces of residual urine with moderate evidence of ureteral and pelvic dilatation on the right side. Examination revealed two congenital anomalies, a diverticulum of the penile portion of the urethra and two bicuspid valves in the posterior urethra. The former was treated by excision and closure of the urethra and the latter by fulguration. The pathological examination of the diverticulum showed the epithelium to vary from a flat cubical type of cell to a squamous type. Since operation the child has been completely free of his former symptoms and has improved in his feeling of general well-being.

There is another group of cases, falsely considered as enuretics where ectopic ureteral orifices account for the symptom. A ureteral orifice may be located in the urethra, in the vagina, or at a site around the urethral meatus in the vestibule. This usually occurs in girls and is most commonly a unilateral anomaly. The urine from that side being expelled on to an external surface may give the impression that this is a true enuresis. These children void normally, have good force, empty the bladder well, and no residual urine is found. The tone of the urethral muscle is normal and yet this continual drainage of urine is maintained. Considerable care in the examination may be required before the site of the ureteral orifice is located, particularly when it is situated in the urethra. Early discovery of this type of anomaly may mean the salvation of a kidney while if the anomaly is allowed to persist, secondary infection in the lower end of the ureter and consequent inflammatory obstruction at that site will result in the kidney from that side being grossly infected. Slides were shown of a young girl of 5 years who was considered to be suffering from enuresis until she developed an acute infection in a hydronephrotic kidney. When seen, her intravenous urogram revealed no function on her left side and a normal kidney on the right. When a careful study of the urethra with an endoscope one was able to see a small orifice on the lateral wall. In her case a nephrectomy was necessary.

Persistence of a vestigial structure with an outlet in the region of the urethra may produce symptoms which will simulate enuresis. The Wolffian duct, which should disappear, may remain and by its secretion maintain a considerable watery discharge. Again in this abnormality one finds a normal bladder with normally placed ureteral orifices, renal function is good and both kidneys empty into the bladder. If the opening of the vestigial structure is located, a catheter passed through and the duct injected, the rudimentary structure will be seen running up the posterior wall of the pelvis for a variable distance and may reach as high as the kidney. The fluid obtained from this source is non irritating and does not produce excoriation around the vulva as is seen with involuntary discharge of urine, and it contains no urea. If the opening of this duct becomes blocked, some discomfort and occasionally severe pain associated with a high fever may give the impression that the diagnosis is pyelonephritis. Urinalysis may substantiate that opinion if the infected discharge is mixed with the urine. The following cases demonstrate the abnormality.

1 M.K., a girl of 10 years, who had worn diapers all her life and had been treated ineffectively or occasionally with medicine, was found to fit into this group. Her general examination and the examination of the urinary tract revealed no abnormality. Her intravenous urogram was normal, and cystoscopic examination was normal. The opening of the duct in her case was in the vestibule, and the catheter entering this passed on up to the region of the left kidney. When injected with an opaque media, a hugely dilated duct was demonstrated and the fluid obtained through the catheter was shown to be free of urea. This duct was removed by first freeing the upper end, which was blind, and following this down posteriorly to the broad ligament where it ended as a small fibrous cord.

2 This was a girl of 3, with a similar history plus intermittent attacks of pain in the right abdomen, associated with fever. Her intravenous pyelogram and cystoscopic examination were normal, while a careful search of the urethra demonstrated a small opening from which frank pus occasionally escaped. Injection of this duct revealed a similar lesion as seen in the foregoing case. This duct was also removed and resulted in a cessation of her previous disability.

In conclusion, I would say that a conscientious attempt to determine the cause of enuresis should be made. Although by far the large majority of cases of enuresis will be time limited and will be cleared without any interference, the disastrous effects of overlooking a serious destructive lesion should be kept in mind.

CHRONIC NON-SPECIFIC THYROIDITIS

By C. George Horii, M.D.

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It is stated that Riedel's struma and Hashimoto's disease are rare conditions, the rate incidence of the former being about 0.1 or 0.2 of all cases of goitre in which operations have been performed in the Mayo Clinic.¹ However, recently, we had two of these cases within a week and these together with three other cases admitted in this hospital within recent years form the basis for the present report.

Of the series of 170 consecutive cases of subtotal thyroidectomies performed during the past several years in this hospital, there were cases of Riedel's struma and three cases of Hashimoto's disease. On the other hand, carcinoma of the thyroid gland is reported to be more common, the incidence being 2.5 to 3% of all patients operated on for goitres.² In our series there was only one case of goitre considered to be of low-grade malignancy, and it was found in the lateral aberrant mass.

Both of these conditions are stated to be accompanied by symptoms of the disturbance of thyroid function, other than local enlargement and pressure symptoms upon the adjacent structures.³ In fact, the basal metabolic rate is often found to be below normal in Hashimoto's disease.⁴ In the five cases here reported, presented one or more symptoms of hypothyroidism such as nervousness, tremor, sweating, tachycardia, loss of weight. Basal metabolic rate was elevated in four cases. The fifth had a rate of minus five, but this patient had complained of nervousness, sensation of heat, tachycardia, loss of weight and had mild exophthalmos.

At operation the gland was found to be very hard in consistency and nodular, particularly in Riedel's struma, and the enlargement involved both lobes of the thyroid in four cases. In one case of Riedel's struma the swelling confined only to the left lobe.

In all cases, the margin of the glandular swelling could not be well delineated and considerable difficulty was encountered in its dissection because the glands merged into adjacent structure, particularly the trachea to which it is densely adherent. Because of these adhesions, it had been extremely difficult to avoid injury to the recurrent laryngeal nerves and to the parathyroids. Tracheitis occurred postoperatively in four cases, lasting for five or six days.

The appearance of a myxedematous state following partial thyroidectomy for these conditions has been reported to be quite common. In our series the basal metabolic rate of one case of Riedel's struma came down to minus 13 and 60 cases of Hashimoto's disease came down to minus 19 and minus 11, following the operations. However, no clinical evidence of myxedema was noticed during the postoperative period of observation.

The microscopic picture presented in all these cases was typical. Marked hypertrophy of the lymphoid tissue replacing the parenchyma and growing degenerating germinal centres of the lymphoid tissue and degenerating acini were observed in all three cases of Hashimoto's disease. In the two cases of Riedel's struma, extension of the connective tissue into the surrounding tissue, discrete, isolated acini, showing various stages of degeneration, diffuse infiltration of the connective tissue separating the acini and in areas causing sclerosis of the gland tissue, as observed.

CASE 1

Female, aged 47 years, admitted on December 2, complaining of swelling in the left side of the neck, during the past one year, with nervousness, tachycardia and discomfort.

Examination revealed a painless lump about the size of a walnut in the left lobe of the thyroid gland, which moved up and down on swallowing. At operation the tumor mass, about one and three quarters of an inch long and one inch in diameter, was dissected out with some difficulty. Mild tracheitis was present for five days postoperatively.

Pathologic diagnosis: chronic thyroiditis, Riedel's struma.

CASE 2

Female, aged 29 years, admitted February 17, complaining of swelling in the neck for six months, fainting, palpitations, nervousness for the past four years, nervous appetite but loss of weight of ten pounds during the past six months, and sensations of cold for several years.

Examination showed enlargement of the thyroid in both lobes, but particularly in the isthmus and right lobe, which felt nodular. Blood pressure 120/58, pulse 99. Heart beats were accentuated with occasional premature systole. Systolic murmur heard all over the pre-

cordium. Hands were warm and moist and there were fine tremors in the extended hands. The electrocardiogram and x-ray of the chest were normal. Basal metabolic rate was plus 21, and blood cholesterol 154.

Thyroidectomy was performed. Four days after the operation, basal metabolic rate was plus 13 and 14 days after the operation it was minus 8. Tracheitis present for seven days.

Pathologic diagnosis: Riedel's struma.

CASE 3

Female, aged 41 years, admitted on June 7, complaining of mass in the neck which had been present for thirty years, and which recently increased in size. Patient was also complaining of tiredness, and palpitation. Examination revealed swelling in the suprasternal area, which moved up and down on swallowing. The basal metabolic rate was plus 8.

At the operation the gland was found to be hard and firmly adherent to the trachea. Four fifths of the gland and all of the isthmus was removed. Eight days after the operation basal metabolic rate was minus 11.

Pathologic diagnosis: Hashimoto's disease.

CASE 4

Female, aged 35 years, admitted on March 13, complaining of weakness and loss of ambition, nervousness and swelling in the neck for several years.

Examination revealed blood pressure 118/76, pulse rate, 100, and a slight widening of the palpebral fissures. There was an enlargement of the thyroid gland on the right side and to less extent on the left side as well. Basal metabolic rate was plus 26 and the blood cholesterol was 119 mgm %.

At the operation a rubbery, hard, nodular enlargement of the gland was removed from the right side and a smaller one from the lower pole of the left one. Seven days after the operation the basal metabolic rate had gone down to 0.

Pathologic diagnosis: Hashimoto's disease.

CASE 5

Female, aged 60 years, admitted on October 1, complaining of swelling in the right side of the neck for the past five years, gradually enlarged to the size of a lemon. She also complained of nervousness, sensation of heat and slight exophthalmos.

Examination showed, blood pressure 190/110, pulse rate 90. There was a nodular enlargement of the thyroid gland found in the right lobe. A small one was also found on the left side. Basal metabolic rate was minus 5. X-ray showed enlarged thyroid with retrosternal extension. The trachea was displaced but not constricted.

At operation two thirds of the thyroid was removed on the right side as well as from the left. Basal metabolic rate twelve days after the operation was minus 19.

Pathologic diagnosis: Hashimoto's disease.

SUMMARY AND CONCLUSION

1 Hashimoto's disease and Riedel's struma are not as rare as reported.

2 They are usually accompanied by one or more symptoms of hyperthyroidism, and the basal metabolic rate may be elevated.

3 At the operation, whenever hard glandular enlargement that envelops and becomes adherent to the trachea is observed, these diseases must be considered for diagnosis and depending upon the basal metabolic rate, due conservation must be exercised in extirpating the gland, since there

is a good possibility for a myxoedematous state to occur following the operation

I am indebted to Dr H S Dolan for criticisms and suggestions in the preparation of this paper

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CASE REPORTS

PRIMITIVE RETICULO SARCOMA OF THE KIDNEY

By Paul Bourgeois, F R C S [C]

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Consulting Urologist to Ste Justine Hospital,
Montreal

Tumours of the kidney observed in the first decade of life differ markedly from renal tumours developing in adult life. Most of the time, they are represented by a mixed growth, the so called adenomyosarcoma of Wilms.

One might say that Wilms tumours make up 75% of the cases. Once in a while, it is possible to obtain a report in the medical literature of a benign tumour or even of a teratoma. The histological classification is of interest only to the pathologist but we think that every urologist should try his best to throw light on the simple clinical diagnosis.

This is why we have thought it of interest to present for discussion a case that we had the good fortune to follow for a period of nearly two years.

On Jul 10 1944 M.C. a girl, 7 years of age, was admitted to Ste Justine Hospital. In the previous 3 or 4 weeks, her mother had noted while bathing the child, that her left side seemed to be enlarged. Two days previously the family doctor by means of a blood count, had eliminated a enlarged spleen.

The history does not bring out any particular fact of importance. This child had always been more "fragile" than her brother and sisters. She had trouble to keep up with her classmates in school very often was subject to paroxysmal colds. She never had any difficulty in micturition, no frequency, no dysuria, no pain on urination. Her appetite was excellent, her bowels moved regularly and she did not complain of any soreness in her abdomen, but she tired easily, did not play with other children and stayed by herself.

The clinical examination revealed a child, under weight, anemic and slightly dyspneic. The abdomen

was moderately distended and on inspection a could be seen in the left upper quadrant. Bimanual palpation revealed a tumour the size of a large fruit, hard, apparently fixed, extending to the midline. The tumour was absolutely painless.

The blood count showed 1,400,000 red blood cells, 11,500 white blood cells, 79% Hb 74% polymorphs 25% lymphocytes. Urinalysis was normal except for very small quantities of albumin and a few bacteria.

A barium meal showed that the stomach was positioned towards the right by an opaque and round tumour apparently coming from the renal region. A preoperative diagnosis of perirenal tumour was made.

On July 18, under local anaesthesia, a 16 F cystoscopic examination was performed. The bladder capacity was normal and the mucosa was normal. The ureters which were normal were catheterized up to centimetres. Urine was collected on each side, showed no bacteria or pus. On the left side, papillary cysts were found. A phenolsulphonphthalein intravenous injection showed at the end of 70 minutes 36% on the right side and 10% on the left side.

A plain film taken with the opaque catheters revealed on the left side, a mass which was round, outlined and seemed to occupy the left renal region. The filling of the right pelvis with iodine gave a pyelogram.

On the left side the pelvis was a little enlarged situated at the level of the body of the third lumbar vertebra and there seemed to be a definite compression of the upper calyx by the mass which had taken place of the upper pole of the kidney.

The diagnosis of calicified cyst was then established and a lumbar incision decided on. The next day, child had to be transferred to the contagious disease department on account of a swelling of the right parotid gland.

Finally on August 1944 under cyclopropane anaesthesia a left lumbar incision was made and a tumour was found very intimately adherent to kidney.

A total nephrectomy was performed. It did not present any special difficulty except at the site of pedicle where the stomach had to be pushed back blunt dissection. The tumour and kidney were removed en masse and the wound closed in three layers, with cigarette drains.

The postoperative course was uneventful outside very slight reactions to the blood transfusions. Child was discharged on the 15th day with the wound completely healed.

Since then, she has reported to the out-patient department. I saw her last on May 21, 1946. She is now 9 years old, and weighs 55 pounds. Her abdomen seems normal, her appetite is good and she goes to school like any girl of her age. Urinalysis is completely normal and there are no clinical signs of metastases.

The interesting part of this case is in the tremendous pathological report which took nearly three months to be finished. On Oct 17, Professor Pierre Masson, head of the department of pathology at the University of Montreal honoured me with a five-page document to me that his huge experience in classifying tumours known the world over had been baffled by this most unusual case.

I take the liberty to give you a résumé of the results of gross examination and present

* Read at the Seventy-seventh Annual Meeting of the Canadian Medical Association, Section of Urology, Banff, Alberta, June 14, 1946

with his conclusions. I have brought the slides and those interested are very heartily welcomed to examine them. The pathological report, translated through the courtesy of Professor L. C. Simard, Pathologist in Chief at Notre Dame Hospital is as follows:

Pathological report (by Professor Pierre Masson)—The tumour is spherical and measures 13 cm. in diameter, it weighs 1200 grams and occupies the upper pole of the kidney. The lower half of the kidney and the pelvis are protruding under the tumour. The capsule of the kidney is continuous with the capsule of the tumour.

A medio sagittal section shows a normal kidney in its lower four fifths. Its superior limit is continuous with the tumour, but seems to be at the same time compressed and infiltrated by

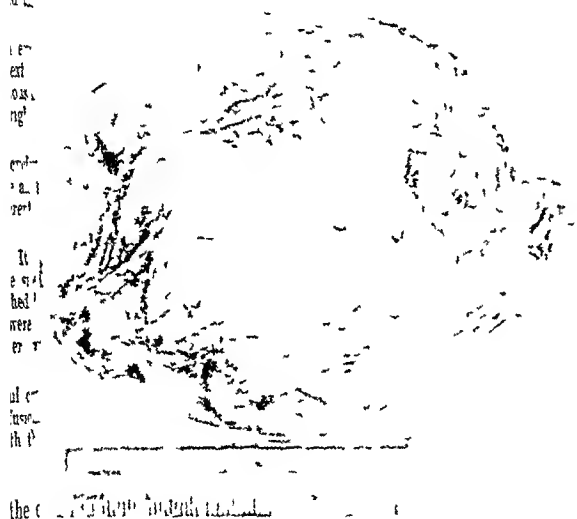


Fig. 1

Gross examination—It cannot be cut easily, of some of its parts are soft and pink-white, others are grey, hard, chalky, and when cut, crushes the other soft parts. The cut surface, therefore, is imperfect, but presents lobulations of 1 to 3 cm. in diameter and incompletely surrounded by fibrous bands. Some of the lobules are mostly soft and punctuated by an opaque, modified substance. In some others the calcareous part predominates and there exist only small nodules of soft tissue. Nodules and bands have been of rather uniform diameter of 0.5 to 0.8 mm. and seem to correspond to the section in different planes of ramifying anastomosed cords enclosed in a calcified sheath which at the same time

isolates and supports them. Some of the cords are larger than the others, have a central cavity filled with blood.

Fragments of the tumours have been fixed in Bouin Muller-formol and saline formol. For the first paraffin blocks could not be cut and decalcification was indispensable. This was easy and rapid but accompanied by a violent muscular discharge which dislocated the fragments.

Microscopic examination—(1) *Capsule*—The tumour is enclosed in a capsule which is irregular in thickness but everywhere more thick than the kidney capsule. The tumour capsule shows interesting features. It is made of two layers: one external fibro-lamellar and thin in which appear small smooth muscle fibres; this layer is continuous with the interior kidney capsule. The internal layer which is adherent to the former varies in thickness; it is lamellar externally and fibrous in its inner region. In its interstices appear remnants of the kidney flattened Bowman capsules with vascular and sclerosed glomeruli and tubes with acinar cuboidal epithelium, probably of excretory nature. Similar elements may be found also dispersed in the fibrous bands of the tumour. There is no precise limit between this internal layer and the tumour tissue. On the contrary the layer is invaded outwardly by cellular strands which insinuate themselves between the glandular remnants and surround them afterwards.

From these findings one may conclude that (a) the neoplasm has not arisen outside of the kidney to invade it afterwards but in the kidney itself, (b) it has grown in the superior pole of the kidney, has infiltrated the parenchyma, atrophied a part of it and compressed it on the distended kidney capsule.

(2) *Tumour tissue*—(a) *General characters*—The tumour tissue is very cellular. Under low power it shows relatively large nuclei, moderately "chromophilic," enclosed in a clear, weakly acidophilic, cytoplasm. The cells are grouped together and between them appear a loose network of collagenous and argentine material. To these elements, which are organized in the massive regions—which contain subcapsular zones, where are the remnants—are added blood vessels. The general structure of the neoplastic tissue is well preserved near the vessels but away from them it

becomes necrosed. So that each vessel is sheathed by a living tissue layer, perithelial in aspect, separated from similar ones by more or less degeneration and calcification. These vessels, which are mostly capillaries, are separated from the tumour cells by a collagenous membrane. This is very thin near the invasive zones where the capillaries are narrow, but it becomes progressively thicker where the vessels are larger. Some of these have a rudiment of a muscular media.

(b) *Cytology*—The nuclei of the tumour cells are regular in size, but have varied forms: spherical, oval or kidney shape. The chromatin network is dense and very delicate, with one or two nucleoli here and there. The mitoses are all typical and moderately abundant; there are about two in each field.

The cytoplasm is everywhere clear and transparent, poorly stained and purely acidophilic. It has however some important morphological differences in various regions. In certain parts there are no limits between nucleated areas which seem to form a syncytium. In others the tumour itself, oedematous, becomes lacunar. Then each nucleus is enclosed in a cytoplasmic body, stellate in form, anastomosed with others, and forms with them a symplastic reticulum. In other places the cytoplasm is individualized around each nucleus. Here the contours of the cells are well demarcated. Most of these are spherical and their nucleus is more or less eccentric. Here and there however, they are elongated and disposed radially around blood vessels; here the perithelial structure is at its best.

Most of the tumour cells, individualized or symplastic, have a peculiar structure which is puzzling. In the cytoplasm, near the nucleus there is an inclusion, perfectly spherical, well outlined, homogeneous and glassy in aspect, which is stained weakly in pink by phloxin and a pure pale blue by anilin blue. This sphere is 3 to 8 mm in diameter. In round cells it occupies the centre of the cytoplasm and pushes aside the nucleus. In the elongated cells, disposed in rosettes around the capillaries, it invariably occupies the vascular pole. It seems to be very resistant and rigid; in certain regions of the tumour that has been altered by the surgical trauma or by poor fixation only the spheres remain intact.

What is the significance of this peculiar inclusion? There is no doubt that it occupies

the place of the Golgi apparatus; its aspect and staining capacities are similar to those of the colloid of the thyroid gland, but that does not permit of identification, and I must confess I do not know any normal cell which has anything similar. I have seen similar formations in juxta-renal and not in intra-renal tumours. This is the more regrettable because this inclusion is striking enough to give to the tumour a characteristic aspect.

(c) *Local characters*—The neoplastic tissue with its symplastic and cellular aspects and fibrillar network is so generalized throughout the tumour that it can be considered as unique in nature. It presents however some important local variations.

In the invasive zones and immediately behind them, it forms strands and then confused meshes in which the contiguous cells are enclosed in the meshes of a dense fibrillar network without precise orientation. There are here no blood vessels of any kind. These appear in the deeper regions, they are narrow and sparse, the endothelium is separated from the tumour cells by a thin collagen membrane. On this are implanted the fibrils of the intercellular network.

Still more deeply, pyknotic nuclei appear in the intervals, and far from the capillaries, and then still deeper necrotic zones. Only eight to ten layers of cells remain well preserved around each vessel. The lumen of the vessel becomes larger and its endothelial lining is surrounded by a sclerosed sheath. The tissue tuft which surrounds each vessel is not inert, the cells continue to proliferate, those that are far away from the vessel continue to undergo necrosis so that the living tuft keeps the same thickness and only the necrotic mass increases in size.

The structure of this living cellular sheath undergoes slight modifications: its reticular ground substance becomes thicker and forms large meshes, somewhat flattened in relation to the vessel and seeming to orient themselves concentrically around it. The tumour cells accumulated in these meshes form cords which are disposed in circles or spirals around the vessel. When the cells are near the vessel their orientation is sometimes perpendicular to it, and the inclusion is turned toward the vessel.

The vessels of each tumour lobe are communicating; they form a vast capillary network communicating with several large vessels. The wall of these is fibrous and very thick, their endothelium is surrounded by several

Solid teratomas of the ovary and testicle are extremely complex with all three types of tissue growing in wild profusion forming rudimentary organs even teeth, eyes or bowel and even chorionic tissue. The teratomas of the ovary occur most commonly between the ages of adolescence and usually run a malignant course from malignant degeneration of one of the contained types of tissue. Though the pathological picture is often a blur at the time of primary operation the histological picture of solid teratomas of the ovary in the world literature is 65% and probably more of the diagnoses of benignancy when the serial sections of all portions of the tumour could be examined.

There are two main theories of the origin of these tumours. That of Langerhans suggests that as the unfertilized ovum is dependent on able to produce all types of tissue some unknown stimuli may start development of the unfertilized sex cell, which produces a fetus like tumour. This could explain very easily the type of teratoma occurring in adolescence. The theory of Marchand Bonnet is that, during the development of the fertilized ovum, one blastomere becomes segregated and does not develop with the remaining blastomeres, but later develops a teratoma which may be complex or simple depending on the degree of segmentation that has occurred before isolation of the blastomere occurred. If it occurred early, the cell rest thus formed would be capable of forming all types of tissues. If it occurred late, a certain degree of specialization would have occurred, so that one or two types of tissue would predominate as in dermoid cysts. This isolation of a blastomere is similar to the process that occurs in the formation of identical twins and might be considered a failure in the process of twinning. Teratomas are more frequent in families where twinning is frequent.

Solid teratomas of the ovary are usually moderate in size, but may be very large, and growth so rapid that the tumour usually has reached considerable dimensions before symptoms are produced. The following is a report of a very large teratoma of the ovary in a girl of fourteen.

The patient, M.K., aged 13 years, was brought to my office September 24, 1943, because the menses had started, and, having been overweight in childhood, her parents hoped that this could be corrected at adolescence.

The patient a healthy looking girl 5 feet 4 inches weight 160 pounds, was of the boyish type. Secondary characteristics were not developed. First breast axillary and pubic hair, uterus normal in shape and position and freely movable, adnexa palpable on the rectal examination that was done. No mass felt in the pelvis. The basal metabolic rate was 3. Physical examination was otherwise negative. Because of her obvious endocrine imbalance, she was on thyroid gr 1 daily, plus a low carbohydrate diet. A year later on October 12, 1944, the patient brought to my office again, complaining of enlargement of the abdomen of two months' duration plus amenorrhoea. Since her first visit the periods had been regular until July 1944, which was scanty, and August and September had been missed. The patient first noticed a lump in the lower abdomen in May, 1944, when it apparently the size of a grapefruit. This slowly enlarged till August when it seemed to "break," the whole abdomen became larger and firm. The patient became poor, but there was no interference with bowel or bladder function, and she was very active in sports and school activities.

On examination she looked well. Blood pressure 120/70, the heart and lungs normal. The abdomen was enlarged to the size of a 7 months' pregnancy, symmetrical, and of a rubbery hardness. No fetal parts were palpable and no heart tones could be heard. On pelvic examination, there was a firm mass pulling upwards, which was palpable, up out of the pelvis. Adnexa were not palpable. A diagnosis of pseudomucinous cystadenoma of the ovary was made and patient admitted to hospital. As this mass was pulling the uterus up into the abdomen rather than pushing down, it was most likely to be of pelvic origin, either to the uterus and its appendages and with no connection of ectopic or palpable lymph glands, it was more likely to be benign than malignant. The benign pelvic tumours that attain great size are pseudomucinous cystadenoma of the ovary and fibroidenoma of the uterus or broad ligament. The consistency of this mass was not hard enough to suggest fibroidenoma and fibroidenomas are not as a rule present at this early age while pseudomucinous cystadenoma of the ovary do.

At operation on October 15, 1943 on opening the abdomen, an immense tumour was found extending from the xiphoid cartilage to the pelvic brim, pearly grey colour, with marked veining and irregular, cystic looking translucent bosses. The surface of the tumour densely adherent to the surrounding organs and peritoneal wall. The adhesions were divided with difficulty and the tumour delivered out of the abdomen disclosing its pedicle in the right mesovarium where the ovary had been replaced by the tumour. There was no sign of the tumour having escaped from its capsule or invading the broad ligament although numerous attachments to the broad ligament could be felt. The feeling that it had occurred in the depths of the mass it had already spread far beyond the confines of the teratoma. The tumour was clamped off at its pedicle and excised. Uterus and left adnexa were normal and were left in the abdomen closed.

The patient had an uneventful recovery and was discharged on her 14th postoperative day. Since that time I have examined her at six weekly intervals for a year and there has been no sign of recurrence or metastasis. Periods were resumed the following month and have been normal.

The pathological picture was as follows.

Macroscopic examination.—The specimen consisted of a very large, firm, nodular, greyish coloured mass measuring 25 cm in diameter and weighing 5,850 gm. The capsule is intact, but there are scattered peritoneal adhesions. The surface is largely opaque but a few small cyst like sinuses protrude from the surface. The cut surface is firm but shows a diffuse multicystic structure, the cysts being very small and filled with glistening tenacious pseudomucinous secretion.

Her most recent exposure had been just prior to an admission to this hospital on December 20, 1945 for penicillin treatment (200,000 units) for acute gonococcal urethritis and cervicitis. On that admission there was no evidence of inguinal adenopathy, no genital lesions, and her serologic test for syphilis was negative. She



Fig 1

stated that approximately one week after discharge from hospital she noted a non-tender swelling appear in her left inguinal region, which gradually increased in size, with the overlying skin becoming inflamed. A short time later, a similar swelling appeared in her right inguinal region. Examination revealed temperature 98.2°, pulse 80, and respirations 20. Functional inquiry showed nothing important and the history of past illnesses had no bearing on her present complaints.

On physical examination, only the inguinal and genital regions revealed abnormal findings. The skin covering the inguinal glands on the left side was inflamed and bluish in colour, the lymph glands were enlarged and matted due to a marked amount of perilymphadenitis and there were many confluent areas of gland destruction with demonstrable fluctuation. The induration extended parallel with and proximal to Poupart's ligament, well down toward the genital cleft. On the right side, the skin appeared much more healthy, with less evidence of inflammation. The inguinal glands were enlarged, matted, and firm with no evidence of fluctuation.

Examination of the external genitalia revealed an ulcer on the medial aspect of the left labium minor, approximately 1.5 cm in diameter, irregular in outline with overhanging edges, clean floor and non-indurated base. This ulcer was tender to touch and negative for treponema pallidum on repeated darkfield examination. Lymph node punctures of the inguinal glands were similarly negative for treponema pallidum on darkfield examination. A provisional diagnosis of lymphogranuloma venereum was made.

Laboratory examinations—Hb 65%, white blood cells 8,900. Urine negative. Serologic tests for syphilis were repeatedly negative.

On February 11, 1946, 5 cc of clean, thick, odourless, cream-coloured fluid pus were aspirated from a fluctuant area in the left inguinal region. Direct smear revealed a moderate number of leucocytes with no

bacteria demonstrable. This specimen was examined by the usual laboratory media, including deep meat, but produced no growth. Mice were inoculated intraperitoneally, as well as living chick embryo, and in all instances, a pure culture of the virus lymphogranuloma venereum was isolated.

On February 15, 1946, a Frei test with control, Lederle's Frei antigen was carried out on the surface of the right forearm. In twenty-four hours the Frei test was positive* with a papule 7 mm in diameter, while the surrounding area of erythema was 12 mm in diameter. Within forty-eight hours the papule had increased to 8 mm in diameter. The control remained negative.

On February 19, 1946, the patient was tested cutaneously with an antigen prepared in the bacteriology laboratory of the Toronto Western Hospital, pus aspirated from a fluctuant bubo. Normal saline was used as a control. The area inoculated produced a papule 7 mm in diameter, forty-eight hours later while the control remained negative.

TREATMENT AND PROGRESS

On February 11, the patient was started on a course of sulfathiazole therapy, receiving a loading dose of 4.0 gm and continuing with a dose of 1 gm q.i.d. until a total dose of 50 gm of the drug had been administered. On the eighth day, the patient developed a typical erythema nodosum type of reaction over the abdomen—this was considered to be a toxic manifestation of sulfathiazole and the drug was discontinued. Immediately, the patient began to improve from the time sulfathiazole therapy was instituted, the skin over the inguinal glands became more healthy, tissue destruction ceased and the progress of the disease was apparent brought to a standstill.

On February 26, following 22 days' hospitalization this patient was considered to be sufficiently improved to be discharged to the custody of the female relative disease clinic. Her labial ulcer was healed. The overlying the affected area was still slightly discolored, the inguinal swelling was decidedly decreased and signs of tissue destruction had disappeared. The involved tissue was firm and apparently had undergone fibrosis. There was no evidence of lymphatic obstruction.

The patient was next seen in the out-patient department on March 13, 1946. There were no signs of relapse of the previous infection. The complement fixation test for lymphogranuloma venereum (albumin globulin ratio), and the Wanger flocculation test, been repeated at varying intervals during the ensuing three months, and as shown in Tables I and II the has been consistently falling while the albumin globulin ratio has slowly reverted to normal. When last seen (June 4), this patient was clinically well and no signs of her previous infection were minimal.

Blood serum in various dilutions was set against commercial lymphogranuloma venereum antigen—"Lygranum CF" and gave results shown in Table I.

*A papule of 6 mm diameter or greater, in twenty-four hours, is considered to represent a positive test.

TABLE I
COMPLEMENT-FIXATION REACTIONS TITRATION OF BLOOD SERA AGAINST LYGRANUM CF*

Date	1:5	1:10	1:20	1:40	1:80	1:160	1:320	1:640	1:1280
Feb 11, 1946	++++	++++	++++	++++					
Feb 14, 1946	++++	++++	++++	++++					
Feb 26, 1946	++++	++++	++++	++++	++++	++++	++++	++++	++++
Mar 13, 1946	++++	++++	++++	++++	++++	++++	++++	++++	++++
Apr 11, 1946	++++	++++	++++	++++	++	+	+	+	+

*A complete fixation of the complement in dilution of 1:20 or better is considered to be of positive diagnostic significance.

TABLE II

Date	Total protein	Albumin	Globulin	Formol gel test	Hangar flocculation
	%	%	%		
19, 1946	81	4.59	3.51	Neg	++++
20, 1946				Viscosity increased in 2, 6 and 24 hours	++++
21, 1946	7.8	4.5	3.3	Viscosity increased in 1 hour	++++
26, 1946	7.9	4.7	3.2	Viscosity increased in 2 hours	++++
13, 1946	7.8	4.9	2.9	Viscosity increased in 1 hour	+++
10, 1946	8.2	5.5	2.7	Viscosity increased in 1 hour	+++
4, 1946	8.1	5.2	2.9	Viscosity not increased	+++
				Viscosity not increased	++

Biochemical examination of samples of blood serum gave results as shown in Table II. Epidemiological investigation revealed that patient had had intercourse with a soldier, lately returned from Italy, who at the time of disease was hospitalized in a military hospital for non specific penile ulcers and unhealed inguinal adenopathy. A Frei test, using Tygranum CF antigen, on this soldier yielded in a positive reaction. Biochemical examination of his blood serum showed no change in total protein, albumin-globulin ratio, or the Hangar flocculation test.

SUMMARY

A proved case of lymphogranuloma venereum occurring in Canada has been presented. The patient was treated conservatively with a course of sulfathiazole and obtained an apparent cure after 22 days' hospitalization. Her serum showed changes in the albumin-globulin ratio similar to the findings noted by other observers.¹ A pure culture of the virus was obtained by living chick embryo and mouse inoculation.

The authors wish to thank Dr. N. A. Labroffsky of the Ontario Provincial Virus Laboratory for the work of growing in pure culture the virus of lymphogranuloma venereum and for carrying out the complement fixation test. Mr. T. Stuart Wilson for his biochemical determinations, and the Toronto Western Hospital for making available the case material.

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GENERALIZED OEDEMA ASSOCIATED WITH HYPOPROTEINÆMIA

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Generalized body oedema, not due to renal or cardiac disease, is a rare condition. The literature reveals not more than six well-studied cases of generalized oedema, all of which had an associated hypoproteinaemia of undetermined origin. One of the cases was autopsied. The others remained in fairly good health. The case to be reported concerns a young woman, who developed generalized oedema, associated with hypoproteinaemia, which lasted eight months and disappeared completely about one month after she became pregnant.

Mrs. J. S., a married woman of 27, was first observed by us in the Allergy Clinic on September 17, 1942, where she had been referred with a diagnosis of angioneurotic oedema. This diagnosis, at first glance, appeared not unreasonable. Examination revealed generalized pitting oedema involving the whole body. There was puffiness of the eyelids and face. Pitting could be demonstrated on the extremities, on the forehead and over the sternum. On September 24 the patient was admitted to the ward for study.

Personal history.—Continued nothing significant.

Family history.—Negative.

Previous hospital admission.—On October 27, 1941, the patient had been admitted to the Jewish General Hospital on account of weakness and fatigability, palpitation, nervousness and irritability, loss of 10 pounds in weight in 2 months and excessive perspiration of the hands and feet. The positive findings were: warm perspiring skin, a pulse rate of 90 to 100 and a weight of 110 pounds. Basal metabolism rate was +1 from plus 11 to plus 15%. Blood cholesterol was 140 mgm %c. Lugol's solution was begun on November 1 and on November 19 the basal metabolism rate was -1. The patient was discharged improved on November 23, weighing 111 pounds. The diagnosis was: hypoproteinaemia (mild). She continued taking Lugol's solution until February, 1942.

Present illness.—About the middle of August, 1942, she first began to notice swelling, about the face. Within a few days, her eyes and face became more swollen. Within 2 weeks, her hands and feet were swollen. This was followed by oedema of the sternum.

* From the Department of Medicine (St. Mary's Hospital) and the Department of Medicine (St. Mary's Hospital) Jewish General Hospital.

—that is, the human race—has dwelt on this planet at least a million years. It seems to me it is high time that those who would be wise should look ahead to the consequences of their individual, national, and international actions, not only today and tomorrow, but a hundred, a thousand, a hundred thousand years, ahead.

When she was readmitted on September 24, her weight was 137 pounds, a gain of about 20 pounds in 1 month. Examination, except for generalized edema, was essentially negative. The heart was not enlarged or unusual in shape. Blood pressure readings varied between 106/60 and 122/70. Repeated urine examinations were negative for albumin and sugar. Specific gravity varied between 1.012 and 1.026. Microscopic examination of the sediment was negative. The fundi, optic discs and retinal vessels were normal. The stools were negative for ova. Several electrocardiograms were similar and within normal limits. The T waves were of lower voltage than in the record of 1941. The basal metabolic rate was -2.0%. Bromsulphalein test for liver function was normal. Oral and intravenous glucose tolerance tests showed flat curves as follows:

TABLE I

	a c	15 min	30 min	1 hr	2 hrs	3 hrs
Oral, 100 gm	87.0		93.0	85.6	82.0	78.0
Intravenous, 50 cc, 50%	85.0	135.0	84.0	66.5	80.5	85.0

Blood cholesterol determinations were 175 and 139 mgm %, blood non protein nitrogen 18.4 and 27.5 mgm %, blood chlorides 611 and 627 mgm %, blood sodium 310 mgm %, blood calcium 10.3 and 10.2 mgm %, icteric index was 7.1, total blood protein averaged 4.7% on 12 readings, the highest being 5.6%, the average blood albumin was 2.9%, the highest being 3.2%.

Hemograms were as follows:

TABLE II

Date	Oct 5	Oct 28	Oct 15	Nov 11
Red blood cells	4.9 M	5.6		4.8
Hemoglobin	93	91		87
Colour index	0.94	0.81		0.90
White blood cells	11,600	12,200	14,800	13,100
Stabs	9	12	19	22
Polymorphonuclears	31	27	38	35
Eosinophiles	19	13	15	11
Basophiles	0	1		
Lymphocytes	31	40	20	20
Monocytes	10	7	8	12

Thrombocytes 210,000 to 230,000. Sedimentation rate 1st hour 2 to 4 mm, 2nd hour 4 to 11 mm. Coagulation began at 5 minutes and was complete in 12 minutes. Bleeding time, 1 minute. Intradermal tests with 68 common allergens were negative. An intradermal test with tubercella extract 1/1,000, (Parke Davis) was negative.

The outstanding positive findings were generalized edema, hypoproteinemia and hypalbuminemia, eosinophilia of 11 to 19%, leucocytosis 11,600 to 14,800 and a flat sugar tolerance curve. The usual causes for edema, namely cardiac and renal, could readily be excluded. The patient continued to gain weight, which was obviously due to increasing edema. On November 1, her weight reached 150 pounds.

An experiment to determine the posterior pituitary control of function of the kidney tubules was done on December 19. The patient drank 1,400 cc of water from 2 to 2:30 p.m., and from 2:45 to 4:45 p.m. excreted 1,850 cc of urine with a specific gravity of 1.061. A result well within normal limits.

A variety of treatments, mainly empirical, were attempted, in order to reduce the edema. These included fluid restriction with a low salt diet, high protein diets, intravenous aminoacids, intravenous plasma, diuretics including ammonium chloride, potassium nitrate and intravenous mercurials, and desiccated thyroid. Except for a limited diuresis following an intravenous mercurial

diuretic, these methods proved ineffective. The patient was discharged on January 30, 1944, with a diagnosis of generalized edema of unknown origin, weighing 160 pounds and her general condition unchanged.

She became pregnant in March 1943. Four later, the edema began to disappear. On April 1 there was no evidence of edema. The blood protein risen to 6% and the blood albumin to 4.1%. A gram showed 17 million red blood cells, 92% globin, 11,700 white blood cells, stabs 15%, polymorphonuclears 13%, eosinophiles 2%, lymphocytes monocytes 7%, thrombocytes 260,000. The sedimentation rate was 1 mm the first hour and 9 mm the second hour.

The patient felt well during the entire pregnancy and showed absolutely no edema. A sugar test on December 10, 1943 showed a low normal

TABLE III

	a c	30 min	1 hr	2 hrs
Oral 100 grams glucose	90.0	147.0	139.5	106.0

On December 16 the patient had a spontaneous normal delivery of a healthy female infant. An electrocardiogram on December 20, 1943 showed high and T waves than in the record of November. The postpartum period was uneventful until the day, when a severe uterine hemorrhage occurred. Despite of packing this continued to a degree necessitating a supracervical hysterectomy 5 days later. The patient was last seen on January 22, 1945, and appeared to be in good health. Blood proteins were 6.25% blood albumin 5%.

Pathological report of uterus—Microscopically was some enlargement, with muscular fibromatosis.

Microscopic—In all situations the material ad to the endometrial surface of the uterus is composed of thrombus, composed of alternating layers of white blood cells and fibrin. This is intimately attached to the myometrium and in places shows organization with newly formed blood vessels and fibroblasts. Careful examination of all situations to reveal anything that can be recognized as pathological. The myometrium shows increase in the size and number of individual myometrial muscle fibers. There is considerable edema throughout the myometrium, interstitial hemorrhage is seen and the myometrium well vascularized by innumerable small and thin blood vessels. About a considerable number of polymorphonuclear leukocytes and small numbers of polymorphonuclear leukocytes are scattered. This indicates a severe cellular reaction most abundant near the internal surface and extends for a considerable distance into the myometrium.

Remarks—Subinvolution of uterus, subacute.

DISCUSSION

The patient's history did not reveal any evidence of inadequate protein intake. No high protein diets had no effect on the proteins. There was nothing to suggest any intestinal absorption of proteins. Unfortunately it was not possible to do a nitrogen balance study. However no condition was present to our knowledge could produce an excessive loss of protein. There remained therefore likelihood that failure of albumin synthesis is responsible for the low blood proteins and

The patient edema Bruckman and Peters¹ state edema almost always develops when the in falls below 3 gm per 100 cc

study of this case suggests the possibility are dealing with an underlying disturbance of the anterior pituitary gland During

admission to the hospital in 1941, this had symptoms of mild thyrotoxicosis, could be attributed to a hyperfunction of

anterior pituitary gland and particularly of a thyrotropic factor In 1942, during the of edema, there was present a disturbed

hydrate metabolism, as evidenced by a low tolerance curve This would favour the that there was now a hypofunction of the

or pituitary gland and particularly the hydrate-influencing factor

h pregnancy there occurs an increase in activity of the anterior pituitary gland

her pregnancy, our patient showed a the sugar tolerance curve which appeared the normal, concomitant with a rise in

od proteins and the disappearance of the It therefore seems not unlikely that

ney, by stimulating the activity of a ish, hypofunctioning anterior pituitary

ne favourably influenced a metabolic disorder in which the outstanding symptom was of rel

ized edema

beginning of the literature reveals only a small number of unexplained edema associated with hyp

edema The first clearly recorded case, in a male as described by Miers and Taylor² in 1933

and Goadby³ in 1935 reported a case of idiopathic here edema in a male of 20, associated with

sum edema Their conclusions were that the edema in a deficient production of plasma proteins

l thus note several possibly similar cases from the literature Lungman⁴ in 1922 described a

polymia 28, suffering from weakness and edema, inflammation proteins varying from between 39 and

the no cause for which could be discovered able dyspepsia in 1925, reported having seen 3 cases of

large doses Rylands in 1942 reported a well studied case of generalized edema of 8 years' duration in a 24 year old female, associated with an eosinophilia of 7%, with total serum proteins of 30 to 46% Rylands summarized and compared four of the previously reported cases with his own His conclusions were that this was a "syndrome in which the formation of serum proteins is in appreciably defective although the liver undoubtedly forms some of the plasma proteins, the evidence suggests bone marrow (or the reticulo endothelial system) as another site"

SUMMARY

1 A case of generalized edema associated with hypoproteinaemia is described in a 27-year old female

2 This condition lasted 8 months and disappeared 1 month after the patient became pregnant

3 The evidence in this case suggests the syndrome was directly related to a temporary disturbance in function of the anterior portion of the pituitary gland

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SPECIAL ARTICLE

THE WORLD HEALTH ORGANIZATION

By T. C. Routley, CBE, LL.D., M.D.,
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To China and Brazil must be given the credit for having suggested at the San Francisco Conference of the United Nations in June 1945 that among the specialized agencies or organizations to be set up by the United Nations an international health organization should be considered to occupy a prominent position. A resolution supporting the suggestion was adopted unanimously.

On February 15, 1946, the Economic and Social Council of the United Nations took action on the resolution as recorded in the following minute:

"The Economic and Social Council, at the request of the declaration proposed jointly by the delegation of Brazil and China at San Francisco, which was unanimously approved regarding an International Health Conference, and recognizing the urgent need for international action in the field of public health,

- (1) decides to call an international conference to consider the scope of, and the appropriate machinery for, international action in the field of public health and proposes for the establishment of a single international health organization of the United Nations,
- (2) urges the Members of the United Nations to send as representatives to this conference experts in public health,
- (3) establishes a Technical Preparatory Committee to prepare a draft annotated agenda and proposals for the consideration of the Conference, and appoints sixteen experts or their alternates to constitute the Committee,
- (4) directs the Technical Preparatory Committee to meet in Paris not later than 15 March 1946, and to submit its report, including the draft annotated agenda and proposals, to the Members of the United Nations and to the Council not later than 1 May 1946,
- (5) decides that any observations it may make at its second session on the report of the Technical Preparatory Committee will be communicated to the proposed International Conference,
- (6) instructs the Secretary General to call the Conference not later than 20 June 1946, and, in consultation with the President of the Council to select the place of meeting."

The Technical Preparatory Committee met in Paris for three weeks, beginning March 18, 1946, and reported back to the Economic and Social Council as instructed, recommending that an international health organization be set up and brought into relationship with the United Nations through the Economic and Social Council.

The International Health Conference met in the City of New York June 19 to July 22, 1946.

The governments of the following States were represented at the Conference by delegates

Argentina	Lebanon
Australia	Liberia
Belgium	Luxembourg
Bolivia	Mexico
Brazil	Netherlands
Bulgarian Soviet Socialist Republic	New Zealand
Canada	Nicaragua
Chile	Norway
China	Panama
Colombia	Paraguay
Costa Rica	Peru
Cuba	Philippines
Czechoslovakia	Commonwealth
Denmark	Poland
Dominican Republic	Saudi Arabia
Ecuador	Syria
Egypt	Turkey
El Salvador	Ukrainian Soviet Socialist Republic
Ethiopia	Union of Soviet Socialist Republics
France	Union of South Africa
Greece	United Kingdom
Guatemala	United States of America
Haiti	Uruguay
Honduras	Venezuela
India	Yugoslavia
Iran	
Iraq	

The governments of the following States were represented by observers

Albania	Italy
Austria	Portugal
Bulgaria	Spain
Cire	Sweden
Finland	Switzerland
Hungary	Transjordan
Iceland	

The Allied Control Authorities in Japan and Korea were represented by observers. The following international organizations represented by observers: Food and Agricultural Organization of the United Nations, International Labour Organization, League of Red Cross Societies, Office International d'Hygiène Publique, Pan-American Sanitary Bureau, International Civil Aviation Organization, The Rockefeller Foundation, United Nations Educational Scientific and Cultural Organization, United Nations Relief and Rehabilitation Administration, World Federation of Trade Unions.

The Conference had before it and used as basis of discussion Proposals for the Constitution of the World Health Organization, Resolutions adopted by the Technical Preparatory Committee. A number of proposals forwarded by governments and various organizations were also before the Conference.

As a result of the deliberations of the Conference as recorded in the minutes and of the respective committees and sub-committees and of the plenary sessions, instruments drawn up and signed providing a Constitution of the World Health Organization and Agreement for the Establishment of an Interim Commission of the World Health Organization.

In the opinion of the writer, who had the privilege of attending the Conference as a delegate from Canada, the Constitution of the World Health Organization is a document of such importance to the medical profession in the world that it seems proper to make it available to the readers of the *Journal*. It may be that over the years which he has lately ahead the implementation of this institution by the nations of the world may long way towards fostering that universal harmony among all peoples which is so far peace. The industry of healing, which knows no boundaries nor barriers, and every human being understands, provides the best medium for the promotion of understanding and goodwill.

An Interim Commission of 18 persons representing 18 nations of which Canada is been set up to bring the World Health Organization into being. The Commission meets once and proposes to hold its second meeting in Geneva in November 1946. No time lost in getting on with its program. Within months after 26 nations formally ratify the Constitution, the Commission is obliged to convene the Assembly. The Parliament of the World officially approved the Constitution on

It is confidently anticipated that the number of nations will have done like-
a reasonably short space of time
-ter the auspices of the British Medical
-tion, the medical profession of the world,
-resented in the various national Medical
-tions, has been invited to a conference in
-1 in September. One does not wish to
-ite on decisions which may come from
-conference but it would seem likely, at least
-a writer, that medicine, which to a world
-organization is like electric power to a
-mission line, will desire to ally itself with
-orts of the nations of the world in the
-le objective of assisting all peoples to
-the highest possible level of health

INSTITUTION OF THE WORLD HEALTH ORGANIZATION

THE STATES parties to this Constitution declare, in
-nity with the Charter of the United Nations,
-e following principles are basic to the happiness,
-ious relations and security of all peoples
-Health is a state of complete physical, mental
-social well being and not merely the absence of
-disease or infirmity
-The enjoyment of the highest attainable standard
-health is one of the fundamental rights of every
-man being without distinction of race, religion,
-tribal belief, economic or social condition.
-The health of all peoples is fundamental to the
-ainment of peace and security and is dependent
-on the fullest co-operation of individuals and
-nations
-The achievement of any State in the promotion
-of protection of health is of value to all
-The unequal development in different countries in
-the promotion of health and control of disease,
-especially communicable disease, is a common
-problem
-The health development of the child is of basic
-importance, the ability to live harmoniously in a
-changing total environment is essential to such
-development
-The extension to all peoples of the benefits of
-physical, psychological and related knowledge is
-essential to the fullest attainment of health
-The informed opinion and active co-operation on the
-part of the public are of the utmost importance in
-the improvement of the health of the people
-Governments have a responsibility for the health
-of their peoples which can be fulfilled only by the
-adoption of adequate health and social measures
-TAKING THESE PRINCIPLES, and for the purpose
-of co-operation among themselves and with others to
-protect and promote the health of all peoples, THE
-SIGNING PARTIES agree to the present Constitution
-by establish the World Health Organization as
-a specialized agency of the United Nations

CHAPTER I

OBJECTIVE

ARTICLE 1

The objective of the World Health Organization
(here called the Organization) shall be the attainment
of all peoples of the highest possible level of

CHAPTER II

FUNCTIONS

ARTICLE 2

In order to achieve its objective, the functions of the
Organization shall be

- (a) to act as the directing and coordinating authority on international health work,
- (b) to establish and maintain effective collaboration with the United Nations, specialized agencies, governmental health administrations, professional groups and such other organizations as may be deemed appropriate,
- (c) to assist governments, upon request, in strengthening health services,
- (d) to furnish appropriate technical assistance and, in emergencies, necessary aid upon the request or acceptance of governments,
- (e) to provide or assist in providing, upon the request of the United Nations, health services and facilities to special groups, such as the peoples of trust territories,
- (f) to establish and maintain such administrative and technical services as may be required, including epidemiological and statistical services,
- (g) to stimulate and advance work to eradicate epidemic, endemic and other diseases,
- (h) to promote, in co-operation with other specialized agencies where necessary, the prevention of accidental injuries,
- (i) to promote, in co-operation with other specialized agencies where necessary, the improvement of nutrition, housing sanitation, recreation, economic or working conditions and other aspects of environmental hygiene,
- (j) to promote co-operation among scientific and professional groups which contribute to the advancement of health,
- (k) to propose conventions, agreements and regulations, and make recommendations with respect to international health matters and to perform such duties as may be assigned thereby to the Organization and are consistent with its objective,
- (l) to promote maternal and child health and welfare and to foster the ability to live harmoniously in a changing total environment,
- (m) to foster activities in the field of mental health, especially those affecting the harmony of human relations,
- (n) to promote and conduct research in the field of health,
- (o) to promote improved standards of teaching and training in health, medical and related professions,
- (p) to study and report on, in co-operation with other specialized agencies where necessary, administrative and social techniques affecting public health and medical care from preventive and curative points of view, including hospital services and social security,
- (q) to provide information, counsel and assistance in the field of health,
- (r) to assist in developing an informed public opinion among all peoples on matters of health,
- (s) to establish and revise as necessary international nomenclatures of diseases, of causes of death and of public health practices,
- (t) to standardize diagnostic procedures as necessary,
- (u) to develop, establish and promote international standards with respect to food, biological, pharmaceutical and similar products,
- (v) generally to take all necessary action to attain the objective of the Organization

CHAPTER III

MEMBERSHIP AND ASSOCIATE MEMBERSHIP

ARTICLE 3

Membership in the Organization shall be open to all States

ARTICLE 4

Members of the United Nations may become Members of the Organization by signing or otherwise accepting

this Constitution in accordance with the provision of Chapter XIX and in accordance with their constitutional processes

ARTICLE 5

The States whose governments have been invited to send observers to the International Health Conference held in New York, 1946, may become Members by signing or otherwise accepting this Constitution in accordance with the provisions of Chapter XIX and in accordance with their constitutional processes provided that such signature or acceptance shall be completed before the first session of the Health Assembly

ARTICLE 6

Subject to the conditions of any agreement between the United Nations and the Organization, approved pursuant to Chapter XVI, States which do not become Members in accordance with Articles 1 and 5 may apply to become Members and shall be admitted as Members when their application has been approved by a simple majority vote of the Health Assembly

ARTICLE 7

If a Member fails to meet its financial obligations to the Organization or in other exceptional circumstances the Health Assembly, may, on such conditions as it thinks proper, suspend the voting privileges and services to which a Member is entitled. The Health Assembly shall have the authority to restore such voting privileges and services

ARTICLE 8

Territories or groups of territories which are not responsible for the conduct of their international relations may be admitted as Associate Members by the Health Assembly upon application made on behalf of such territory or group of territories by the Member or other authority having responsibility for their international relations. Representatives of Associate Members to the Health Assembly should be qualified by their technical competence in the field of health and should be chosen from the native population. The nature and extent of the rights and obligations of Associate Members shall be determined by the Health Assembly

CHAPTER IV

ORGANS

ARTICLE 9

The work of the Organization shall be carried out by

- (a) The World Health Assembly (hereinafter called the Health Assembly),
- (b) The Executive Board (hereinafter called the Board),
- (c) The Secretariat

CHAPTER V

THE WORLD HEALTH ASSEMBLY

ARTICLE 10

The Health Assembly shall be composed of delegates representing Members

ARTICLE 11

Each Member shall be represented by not more than three delegates, two of whom shall be designated by the Member as chief delegate. These delegates should be chosen from among persons most qualified by their technical competence in the field of health, preferably representing the national health administration of the Member

ARTICLE 12

Alternates and advisors may accompany delegates

ARTICLE 13

The Health Assembly shall meet in regular session and in such special sessions as may be required. Special sessions shall be convened at the request of the Board or of a majority of the Members

ARTICLE 14

The Health Assembly, at each annual session, shall select the country or region in which the next session shall be held, the Board subsequently placing the proposal. The Board shall determine the place of the special session shall be held

ARTICLE 15

The Board, after consultation with the General of the United Nations, shall determine the dates of each annual and special session

ARTICLE 16

The Health Assembly shall elect its President and other officers at the beginning of each session. They shall hold office until their successors are elected

ARTICLE 17

The Health Assembly shall adopt its own rules of procedure

ARTICLE 18

The functions of the Health Assembly shall be

- (a) to determine the policies of the Organization,
- (b) to name the Members entitled to elect a person to serve on the Board,
- (c) to appoint the Director General,
- (d) to review and approve reports and recommendations of the Board and of the Director General, and to instruct the Board in regard to matters which action, study, investigation or research be considered desirable,
- (e) to establish such committees as may be considered necessary for the work of the Organization,
- (f) to supervise the financial policies of the Organization and to review and approve the budget,
- (g) to instruct the Board and the Director General to bring to the attention of Member States, international organizations, governments, governmental, any matter with regard to which the Health Assembly may consider it appropriate,
- (h) to invite any organization, international governmental or non-governmental, has responsibilities related to those of the Organization, to appoint representatives to participate without right of vote in its meetings of the committees and conferences under its authority, on conditions approved by the Health Assembly, but in the case of organizations, invitations shall be issued only with the consent of the government concerned,
- (i) to consider recommendations bearing on the work of the Organization, made by the General Assembly, the Economic and Social Council, the Security Council, the Trusteeship Council of the United Nations, or to report to them on the steps taken by the Organization to give effect to such recommendations,
- (j) to report to the Economic and Social Council, in accordance with any agreement between the Organization and the United Nations, to promote and conduct research in the field of health by the personnel of the Organization, or to establish of its own institutions or operation with official or non-official personnel of any Member with the consent of the government,
- (k) to establish such other institutions as may be considered desirable,
- (l) to take any other appropriate action in the objective of the Organization

ARTICLE 19

Health Assembly shall have authority to adopt resolutions or agreements with respect to any matter within its competence. Any resolution or agreement adopted by the Health Assembly shall be subject to the approval of the Health Assembly and shall be subject to the approval of the Health Assembly and shall be subject to the approval of the Health Assembly.

ARTICLE 20

Each Member undertakes that it will, within eighteen months after the adoption by the Health Assembly of a resolution or agreement, take action relative to the execution of such convention or agreement. Each Member shall notify the Director General of the action taken and if it does not accept such convention or agreement within the time limit, it will furnish a statement of the reasons for non acceptance. In case of failure of each Member agrees to make an annual report to the Director General in accordance with Chapter

ARTICLE 21

Health Assembly shall have authority to adopt resolutions concerning quarantine and quarantine requirements and other procedures designed to prevent the international spread of disease, nomenclature with respect to diseases, causes of disease and public health practices, standards with respect to diagnostic procedures or international use, standards with respect to the safety, purity and potency of biological pharmaceutical and similar products moving in international commerce, advertising and labelling of biological, pharmaceutical and similar products moving in international commerce.

ARTICLE 22

Regulations adopted pursuant to Article 21 shall be into force for all Members after due notice given of their adoption by the Health Assembly or such Members as may notify the Director of rejection or reservations within the period of the notice.

ARTICLE 23

Health Assembly shall have authority to make recommendations to Members with respect to any matter within the competence of the Organization.

CHAPTER VI
THE EXECUTIVE BOARD

ARTICLE 24

The Board shall consist of eighteen persons designated by the Health Assembly, taking into account the equitable geographical distribution, shall be entitled to designate a person to act as Secretary. Each of these Members should be a person technically qualified in health, who may be accompanied by an expert.

ARTICLE 25

It shall be elected for three years and one-third of the Members elected to the Health Assembly, the terms of office for one year and the terms of office for two years, as determined by lot.

ARTICLE 26

The Board shall meet at least twice a year and shall report to each meeting.

ARTICLE 27

The Board shall elect its Chairman from among its Members and shall adopt its rules of procedure.

ARTICLE 28

- The functions of the Board shall be:
- (a) to give effect to the decisions and policies of the Health Assembly,
 - (b) to act as the executive organ of the Health Assembly,
 - (c) to perform any other functions entrusted to it by the Health Assembly,
 - (d) to advise the Health Assembly on questions referred to it by that body and on matters assigned to the Organization by conventions, agreements and regulations,
 - (e) to submit advice or proposals to the Health Assembly on its own initiative,
 - (f) to prepare the agenda of meetings of the Health Assembly,
 - (g) to submit to the Health Assembly for consideration and approval a general program of work covering a specific period,
 - (h) to study all questions within its competence,
 - (i) to take emergency measures within the functions and financial resources of the Organization to deal with events requiring immediate action. In particular it may authorize the Director General to take the necessary steps to combat epidemics, to participate in the organization of health relief to victims of a calamity and to undertake studies and research the urgency of which has been drawn to the attention of the Board by any Member or by the Director General.

ARTICLE 29

The Board shall exercise on behalf of the whole Health Assembly the powers delegated to it by that body.

CHAPTER VII
THE SECRETARIAT

ARTICLE 30

The Secretariat shall comprise the Director General and such technical and administrative staff as the Organization may require.

ARTICLE 31

The Director General shall be appointed by the Health Assembly on the nomination of the Board on such terms as the Health Assembly may determine. The Director General, subject to the authority of the Board, shall be the chief technical and administrative officer of the Organization.

ARTICLE 32

The Director General shall be *ex officio* Secretary of the Health Assembly, of the Board of all commissions and committees of the Organization and of conferences convened by it. He may delegate these functions.

ARTICLE 33

The Director General or his representative may establish a procedure by agreement with Members permitting him for the purpose of discharging his duties, to have direct access to their various departments, especially to their health administrations and to national health organizations governmental or non governmental. He may also establish direct relations with international organizations whose activities come within the competence of the Organization. He shall keep Regional Offices informed on all matters involving their respective areas.

ARTICLE 34

The Director General shall prepare and submit annually to the Board the financial statements and budget estimates of the Organization

ARTICLE 35

The Director General shall appoint the staff of the Secretariat in accordance with staff regulations established by the Health Assembly. The paramount consideration in the employment of the staff shall be to assure that the efficiency, integrity and internationally representative character of the Secretariat shall be maintained at the highest level. Due regard shall be paid also to the importance of recruiting the staff on as wide a geographical basis as possible

ARTICLE 36

The conditions of service of the staff of the Organization shall conform as far as possible with those of other United Nations organizations

ARTICLE 37

In the performance of their duties the Director General and the staff shall not seek or receive instructions from any government or from any authority external to the Organization. They shall refrain from any action which might reflect on their position as international officers. Each Member of the Organization on its part undertakes to respect the exclusively international character of the Director General and the staff and not to seek to influence them

CHAPTER VIII
COMMITTEES

ARTICLE 38

The Board shall establish such committees as the Health Assembly may direct and, on its own initiative or on the proposal of the Director General, may establish any other committees considered desirable to serve any purpose within the competence of the Organization

ARTICLE 39

The Board, from time to time and in any event annually, shall review the necessity for continuing each committee

ARTICLE 40

The Board may provide for the creation of or the participation by the Organization in joint or mixed committees with other organizations and for the representation of the Organization in committees established by such other organizations

CHAPTER IX
CONFERENCES

ARTICLE 41

The Health Assembly or the Board may convene local, general, technical or other special conferences to consider any matter within the competence of the Organization and may provide for the representation at such conferences of international organizations and, with the consent of the government concerned, of national organizations, government or non governmental. The manner of such representation shall be determined by the Health Assembly or the Board

ARTICLE 42

The Board may provide for representation of the Organization at conferences in which the Board considers that the Organization has an interest

CHAPTER X
HEADQUARTERS

ARTICLE 43

The location of the Headquarters of the Organization shall be determined by the Health Assembly in consultation with the United Nations

CHAPTER XI
REGIONAL ARRANGEMENTS

ARTICLE 44

- (a) The Health Assembly shall from time to time define the geographical areas in which it is desirable to establish a regional organization
- (b) The Health Assembly may, with the approval of a majority of the Members situated in the area so defined, establish a regional organization to meet the special needs of that area. There shall not be more than one regional organization in each region

ARTICLE 45

Each regional organization shall be an integral part of the Organization in accordance with this Constitution

ARTICLE 46

Each regional organization shall consist of a Regional Committee and a Regional Office

ARTICLE 47

Regional Committees shall be composed of representatives of the Member States and Associate Members of the region concerned. Territories or groups of territories within the region, which are not responsible for the conduct of their international relations, are not Associate Members, shall have the right to be represented and to participate in Regional Committees. The nature and extent of the rights and obligations of these territories or groups of territories in Regional Committees shall be determined by the Health Assembly in consultation with the Member or other States having responsibility for the international relations of these territories and with the Member State of the region

ARTICLE 48

Regional Committees shall meet as often as may be necessary and shall determine the place of each meeting

ARTICLE 49

Regional Committees shall adopt their own rules of procedure

ARTICLE 50

- The functions of the Regional Committees shall be:
- (a) to formulate policies governing matters exclusively of regional character
 - (b) to supervise the activities of the Regional Offices
 - (c) to suggest to the Regional Office the technical conferences and such other matters of investigation in health matters as may be of the opinion of the Regional Committee to be of importance to the objective of the Organization in the region
 - (d) to co-operate with the respective regional committees of the United Nations and with other specialized agencies and with other international organizations having in common with the Organization
 - (e) to tender advice through the Director General to the Organization on international matters which have wider than regional significance
 - (f) to recommend additional regional appointments by the governments of the respective States to the proportion of the central budget of the Organization allotted to that region in accordance with the carrying out of the regional functions

ch other functions as may be delegated to the Regional Committee by the Health Assembly, the Board or the Director General

ARTICLE 51

to the general authority of the Director the Organization, the Regional Office shall be administrative organ of the Regional Committee in addition, carry out within the region, the of the Health Assembly and of the Board

ARTICLE 52

head of the Regional Office shall be the Regional appointed by the Board in agreement with the Committee

ARTICLE 53

staff of the Regional Office shall be appointed mer to be determined by agreement between the General and the Regional Director

ARTICLE 54

Pan American sanitary organization represented Pan American Sanitary Bureau and the Pan a Sanitary Conferences, and all other inter nental regional health organizations in existence the date of signature of this Constitution, shall burse be integrated with the Organization This on shall be effected as soon as practicable common action based on mutual consent of the it authorities expressed through the organiza cerned

CHAPTER XII

BUDGET AND EXPENSES

ARTICLE 55

Director General shall prepare and submit to the annual budget estimates of the Organiza Board shall consider and submit to the Health such budget estimates, together with any Nations the Board may deem advisable

ARTICLE 56

t to any agreement between the Organization United Nations, the Health Assembly shall nd approve the budget estimates and shall ap the expenses among the Members in accordance tale to be fixed by the Health Assembly

ARTICLE 57

Health Assembly or the Board acting on behalf with Assembly may accept and administer gifts tests made to the Organization provided that ations attached to such gifts or bequests aro le to the Health Assembly or the Board and istent with the objective and policies of the ion

ARTICLE 58

Special fund to be used at the discretion of the hall be established to meet emergencies and un contingencies

CHAPTER XIII

VOTING

ARTICLE 59

Member shall have one vote in the Health

ARTICLE 60

Decisions of the Health Assembly on important questions shall be made by a two thirds majority of the Members present and voting These questions shall include the adoption of conven ons or agreements, the approval of agreements nging the Organization into relation with the

United Nations and inter governmental organi zations and agencies in accordance with Articles 69, 70, and 72, amendments to this Constitution

(b) Decisions on other questions, including the de termination of additional categories of questions to be decided by a two thirds majority, shall be made by a majority of the Members present and voting

(c) Voting on analogous matters in the Board and in committees of the Organization shall be made in accordance with paragraphs (a) and (b) of this Article

CHAPTER XIV

REPORTS SUBMITTED BY STATES

ARTICLE 61

Each Member shall report annually to the Organiza tion on the action taken and progress achieved in improving the health of its people

ARTICLE 62

Each Member shall report annually on the action taken with respect to recommendations made to it by the Organization and with respect to coventions, agree ments and regulations

ARTICLE 63

Each Member shall communicate promptly to the Organization important laws, regulations, official reports and statistics pertaining to health which have been published in the State concerned

ARTICLE 64

Each Member shall provide statistical and epidemio logical reports in a manner to be determined by the Health Assembly

ARTICLE 65

Each Member shall transmit upon the request of the Board such additional information pertaining to health as may be practicable

CHAPTER XV

LEGAL CAPACITY, PRIVILEGES AND IMMUNITIES

ARTICLE 66

The Organization shall enjoy in the territory of each Member such legal capacity as may be necessary for the fulfilment of its objective and for the exercise of its functions

ARTICLE 67

(a) The Organization shall enjoy in the territory of each Member such privileges and immunities as may be necessary for the fulfilment of its objective and for the exercise of its functions

(b) Representatives of Members, persons designated to serve on the Board and technical and administrative personnel of the Organization shall similarly enjoy such privileges and immunities as are necessary for the independent exercise of their functions in connection with the Organization

ARTICLE 68

Such legal capacity, privileges and immunities shall be defined in a separate agreement to be prepared by the Organization in consultation with the Secretary General of the United Nations and concluded between the Members

CHAPTER XVI

RELATIONS WITH OTHER ORGANIZATIONS

ARTICLE 69

The Organization shall be brought into relation with the United Nations as one of the specialized agencies referred to in Article 57 of the Charter of the United Nations. The agreement or agreements bringing the Organization into relation with the United Nations shall be subject to approval by a two thirds vote of the Health Assembly.

ARTICLE 70

The Organization shall establish effective relations and co operate closely with such other inter governmental organizations as may be desirable. Any formal agreement entered into with such organizations shall be subject to approval by a two thirds vote of the Health Assembly.

ARTICLE 71

The Organization may, on matters within its competence, make suitable arrangements for consultation and co operation with non governmental international organizations and, with the consent of the government concerned, with national organizations, governmental or non governmental.

ARTICLE 72

Subject to the approval by a two thirds vote of the Health Assembly, the Organization may take over from any other international organization or agency whose purpose and activities lie within the field of competence of the Organization such functions, resources and obligations as may be conferred upon the Organization by international agreement or by mutually acceptable arrangements entered into between the competent authorities of the respective organization.

CHAPTER XVII

AMENDMENTS

ARTICLE 73

Texts of proposed amendments to this Constitution shall be communicated by the Director General to Members at least six months in advance of their consideration by the Health Assembly. Amendments shall come into force for all Members when adopted by a two thirds vote of the Health Assembly and accepted by two thirds of the Members in accordance with their respective constitutional processes.

CHAPTER XVIII

INTERPRETATION

ARTICLE 74

The Chinese, English, French, Russian and Spanish texts of this Constitution shall be regarded as equally authentic.

ARTICLE 75

Any question or dispute concerning the interpretation or application of this Constitution which is not settled by negotiation or by the Health Assembly shall be referred to the International Court of Justice in conformity with the Statute of the Court, unless the parties concerned agree on another mode of settlement.

ARTICLE 76

Upon authorization by the General Assembly of the United Nations or upon authorization in accordance with any agreement between the Organization and the United Nations the Organization may request the International Court of Justice for an advisory opinion on any legal question arising within the competence of the Organization.

ARTICLE 77

The Director General may appear before the Court on behalf of the Organization in connection with any proceedings arising out of any such request for an advisory opinion. He shall make arrangements for the presentation of the case before the Court including arrangements for the argument of different views on the question.

CHAPTER XIX

ENTRY INTO FORCE

ARTICLE 78

Subject to the provisions of Chapter III, this Constitution shall remain open to all States for signature or acceptance.

ARTICLE 79

- (a) States may become parties to this Constitution by
 - (i) signature without reservation as to approval,
 - (ii) signature subject to approval followed by acceptance, or
 - (iii) acceptance.
- (b) Acceptance shall be effected by the deposit of a formal instrument with the Secretary General of the United Nations.

ARTICLE 80

This Constitution shall come into force when twenty Members of the United Nations have become parties to it in accordance with the provisions of Article 79.

CLINICAL and LABORATORY
NOTESMOBILIZING THE QUADRICEPS TO
INCREASE ACTIVE MOVEMENT
IN STIFF KNEES

By Captain M. Alexandroff, R C A M C

Toronto

A method of operation for increasing the range of movement in stiff knees (quadriceps-plasty) has been described by T. C. Thompson¹. In his article he states that it is beneficial for the patient to have had quadriceps-strengthening exercises prior to operation. I have drawn up a special program for patients with limited knee movement which resulted in only a few of the intractable cases requiring operation. It consists first of remedial exercises and secondly where necessary of novocaine injection and manipulation.

The purpose of the exercises is to (1) re-educate quadriceps group, (2) increase size of this muscle group, (3) use the results for increasing the angle of active movement in the affected joint. Full results from this program in about 35 cases were not obtained because the Remedial Exercises Instructors, who were carrying out the program, were removed from the hospital just as results were becoming apparent. However, it was evident that many of these patients, if given sufficient and supervised in-

struction on specific exercises would be candidates for return to civilian duty.

There was another group of 12 patients with compound fractures with and without infection who had been immobilized in plaster. Following removal of the casts an average of 19 months of specific exercises did not yield adequate results. The second part of the program was then instituted. Adhesions and fibrous tissues in scars in the skin and in between the muscle layers of the quadriceps group were broken down. The anesthetic was infiltrated into the scar of the skin. The scar was loosened and raised. The needle was then driven into deeper scar tissue and it too was broken down. The difference between scar and normal tissue was easily recognized first by the grating resistance to the 20 gauge 3" needle, and secondly by the amount of force required to inject the novocaine.

The adhesions are broken down in the muscles and between muscle layers so that increased movement is obtained even before manipulation. As an average it was found that seven degrees was gained following injection. In those in whom second and third injections were administered it was found that scar tissue in skin was more mobile. Following this 20 minutes of manipulative flexion is carried out with extreme care. It was found that the first ten to fifteen minutes gave the best results, whereas the last five minutes seemed to consolidate the gains. Immediately following manipulation the patient is allowed up. That night, if some discomfort is present, patient is given aspirin gr. x. The following day he is started on specific exercises again.

SUMMARY

1 There were no cases that did not gain active movement at the time of treatment by this method.

2 Eleven cases on follow-up show increase in the range of active movement following treatment.

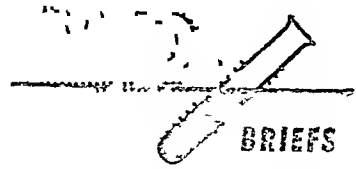
REFERENCES

- 1 THOMPSON, T. C. Quadriceps therapy to improve knee function. *J Bone & Joint*, 25: 216, 1944.

30 Gilgorn Road

It is apparent that much study is needed for a clear understanding of nutrition in the aged. From a practical standpoint and on the basis of present information it would seem wise to recommend that the diet for the aged approximate that of the normal adult and that the supply of minerals and of the B complex be maintained at a satisfactory or increased level. The nutritive value of the diet should be enhanced by giving consideration to such factors as the consistency of food, size of meals, frequency of feedings, and liquid content of the diets as well as the food tradition of the people concerned. — *Nutrition Issues*

VENEREAL DISEASE CAMPAIGN



Treatment of Gonorrhoea with Penicillin
Results of Therapy with Penicillin in Water in Oil Emulsion is Compared with Those Obtained by Single or Multiple Injections of Aqueous Penicillin Solutions. Alfred Cohn, Boris A. Kornblith, Isaac Grunstein, Jules Friend and K. Jefferson Thomson. *Journal of Venereal Disease Information*, Washington 27: 154, 1946.

Following the clinical introduction of penicillin in 1940, the efficacy of treatment of gonococcal infections by means of aqueous penicillin solutions administered intramuscularly in divided doses of varying size at frequent intervals was established by various investigators. Since that time numerous efforts have been made to simplify the administration of the drug.

The present report describes the preparation of water in oil emulsions of penicillin as follows: 100,000 O.U. to 200,000 O.U. of penicillin dissolved in 14 cc. of sterile water, placed in the rubber stopper vial in which the emulsion is prepared commercially. For a dose of 100,000 O.U. or 15 or 10 cc. of the emulsion and 17 gauge needle, 31 cc. of a water-in-oil emulsion of peanut oil (20 parts) and Falba (31 parts) emulsification is accomplished by repeated withdrawals and injections of the penicillin oil Falba mixture from the syringe into the vial containing the original penicillin. This technique can be readily carried out at the bedside, in the office or in the clinic, and is suitable for preparing volumes of emulsions not exceeding 10 cc.

A table is presented giving the results of penicillin therapy in 557 patients with gonococcal infections using various treatment schedules. It was found, for instance, that single injections of 150,000 units of penicillin in water-in-oil emulsion cured 101 of 105 patients, a cure rate of 96.2%, whereas a simultaneous injection of 100,000 units of penicillin in water-in-oil emulsion and 50,000 units in aqueous solution cured all of 49 patients, a cure rate of 100%. No penicillin resistant gonococcal infections were encountered and no untoward local or systemic reactions were seen.

It is noted that therapeutic results depend not only upon the amount of penicillin injected, but also upon the sensitivity of the particular strain of gonococcus, the elimination or inactivation of penicillin in the body, and other factors.

"Find VD Contacts — Report VD Cases"

THE CANADIAN MEDICAL ASSOCIATION**Editorial Offices—3640 University Street, Montreal***(Information regarding contributions and advertising will be found on the second page following the reading material)***EDITORIAL****THE TWENTY-FIFTH ANNIVERSARY OF INSULIN'S DISCOVERY**

WE are permitted to re-publish from *Toronto Saturday Night*, of September 14, the following comment by Dr Lilhan Chase on the 25th anniversary of the discovery of insulin

"Insulin was discovered twenty-five years ago in Toronto. The remarkable thing was not its discovery but its isolation by a man completely unknown in the scientific world. Banting had done no postgraduate laboratory work, he had published no scientific papers, nor had he assisted anyone else in research. Other experienced physiologists had come heartbreakingly near isolation of the active principle of the pancreas. The French had been close, as had the Americans, notably Murlin of New York, but they had been deterred by technical difficulties. Banting read a textbook when he was recovering from battle wounds. He got an idea that stayed. He lacked time to follow it while he was interning in the post war years, but had plenty of time for meditation while waiting for patients in his first practice. The idea grew. He came to Toronto, where the professor of physiology, J J R MacLeod, was an authority on carbohydrate metabolism. MacLeod was impressed enough to give him space, some dogs, and an assistant, C H Best, then went to Scotland on his summer holidays.

"It's all history now. Scientists from the Americas and Europe are making a pilgrimage to Toronto to celebrate on September 16 the 25th anniversary of insulin.

"Research workers are far from complacent in spite of twenty-five years' fruitful industrious labour they still face numerous unsolved problems. How does insulin act? What causes diabetes? Can it be prevented? Can it be cured? Is there danger of a shortage of insulin? The laboratory people know what they need, so much space, so many workers, so many dollars

"The clinicians have just as many problems. They watch a mounting diabetic death rate in every country, they see their apparently well-treated patients develop unpleasant complications. They too know what they want, more co-operation and better team work. They are asking for the assistance of industrious, enthusiastic young doctors, observant nurses, resourceful dietitians, accurate laboratory technicians and understanding social service workers. They want to bridge the gap between known scientific facts and universal clinical application. They plan to make an all-out frontal attack on a widespread but insidious ailment. Diabetes, like other diseases is a problem of many more people than those afflicted with it."

EDITORIAL COMMENTS**Right Heart Catheterization**

Inasmuch as advances in medical research are so frequently associated with the introduction of new techniques of investigation, the increasing use of right heart catheterization in cardiovascular studies is worthy of note.

The method is not entirely new but it is only in the last five years that it has been at all extensively used. The idea of a foreign body introduced at the elbow with its distal termination in the heart, hepatic radicle, or renal vein is, to most of us, a remarkable conception, and great credit is due to Forssman¹ who in 1929 demonstrated on himself that it was feasible to introduce an x-ray opaque metal catheter into the brachial vein and under fluoroscopic control place its distal end in the right auricle.

In 1941 Courmand and Ranges² described the technique in detail and since that time numbers of workers in America and overseas have published their experimental experiences with this means of investigation. Thus, in a Symposium on Cardiac Output of the American Physiological Society a year ago, Courmand³ was able to state that the method, "has proved its safety in well over 1,200 cases not only in ours but in the hands of a number of other investigators in England and in this country" (U.S.A.).

It is possible by his method to obtain mixed venous blood from the heart in order to have data necessary for the determination of cardiac output by the direct Fick principle. The catheter has also been passed through the right

1 FORSSMAN, W. *Klin Wchnschr*, 8, 2085, 1929

2 COURMAND, A. AND RANGES, H. A. *Proc Soc Exp Biol & Med*, 46, 462, 1941

3 AM. *Physiological Soc*, *Federation Proc*, 4, 183, 1945

atrium and on into liver radicles or into the renal vein to obtain blood samples from these regions

Problems studied include the effects of blood loss, post-hemorrhagic fainting, shock, right heart failure, chronic anemia and digitalis upon cardiac output and right auricular pressure. The method is advantageous inasmuch as it may be combined with simultaneous measurements of peripheral and arterial pressure changes and peripheral vascular flow.

An illustrative type of problem approached with the help of this technique is reported by Barcroft and co workers⁴ in a study of post-hemorrhagic fainting. During the faint the cardiac output and the auricular pressure were unchanged, but the forearm blood flow, determined by plethysmograph, was doubled. The sharp drop in arterial blood pressure during fainting was thus shown to be independent of the cardiac output and the venous return to the heart, and related to the muscular (and probably splanchnic) arteriolar dilatation.

In a recent report⁵ the practical advantages of heart catheterization in the differential diagnosis of congenital heart disease are demonstrated. These workers placed the tip of the catheter in a variety of locations within the heart and pulmonary tree and by a study of the oxygen content of samples taken at different sites were able to chart the route taken by the blood in an abnormal heart more accurately than has heretofore been possible. The knowledge so gained is obviously of great importance as regards whether or not surgery is indicated.

The History of the Medical Aspects of the War

We have become history-conscious during the last six years, and with good reason. One result has been that since the early days of this war its medical history has been the subject of continual discussion. In Canada a great deal of preparatory work has been done in the preparation of such a history. Lieut-Col Athol R Gordon was put in charge of the work some three years ago but we understand it will be carried on by another historian. A large amount of material is on hand. In the United States an Advisory Medical Board in the Medical History of World War No 2 has been formed with the approval of the Surgeon General. An ambitious plan has been drawn up by Colonel J H McNeill, Director of the Historical Division of the office of the Surgeon-General, according to which the History will be in three parts. Part I will be devoted to the operation and administration of the Medical Department. Eight volumes

are planned in this phase. Part II will consist of a number of volumes, designed for professional readers and dealing with clinical and technical experience. Part III will consist of a series of medico-military monographs on such subjects as effective utilization of specialists, standardization of supplies, operation of a bed credit system, etc. These will be prepared gradually and will have only a limited distribution.

The completion of these histories in both countries will be awaited with great interest. Histories have a way of hanging fire and it is to be sincerely hoped that these plans will be pushed forward promptly and efficiently.

The Function of Section Meetings

It is by a process of natural development that the program of large general medical meetings has come to be divided into sections. A variation of this is the round table conference, in which there may be a combination of specialties, and of course a difference in presentation. These round table conferences have become a popular and well established feature at all meetings nowadays, but it would be a pity if they should come to be considered as replacing regular section meetings. The criticism has been made that amongst some of those attending the Banff meeting there was a feeling that the section meetings were only for specialists. That is an erroneous view. It is true that section meetings are carried on by those particularly interested in special phases of given subjects but their intention still is to instruct anyone who cares to attend and often the general practitioner will have a very direct interest in the discussion, in dermatology for example. Section meetings will continue to deal with specialties but are not meant only for specialists.

MEN and BOOKS

EARLY MEDICINE OF VANCOUVER ISLAND

By P A C Cousland, M D

Victoria, B C

In talking of the early medical history of Vancouver Island an arbitrary limit had to be chosen as to when the early period ceased, and for that I have chosen the year 1871 the year British Columbia entered Confederation. The earlier history similarly can be arbitrarily divided into two parts. (1) From the landing of Captain Cook at Nootka on the West Coast of Vancouver Island in 1778 to 1849 when Vancouver Island became a Crown Colony. (2)

⁴ BARCROFT, H, EDHOLM, O B, McMICHAEL, J AND SHAPIREY SCHAFER, E P. *The Lancet*, 246 489, 1944

⁵ DUFFY, L, BURWELL, C S, HAYNES, F W AND SPIBBI, R E. *Bull New Eng Med Centre*, 8 113, 1946

* Read at the Seventy seventh Annual Meeting of the Canadian Medical Association, Section of Historical Medicine, Banff Alberta June 12, 1946

From 1849 to 1871, from the time of the original Crown Colony, through the days of the gold rushes to Confederation.

The first period is, of course, the period of exploration and of the fur traders. For two centuries after the discovery of lower California by the Spaniards no exploratory efforts to the north were made by them, if we dismiss the accounts of Maldonado, Juan de Fuca and de Fonte. Scholefield labels these as the apocryphal voyages of glib-tongued impostors. In 1774 and 1775 on orders from the viceroy, ships sailed and explored as far north as the Queen Charlotte Islands without landing on what is now British Columbia. There was then a hiatus in Spanish exploration until 1779, but in the meantime Captain Cook, on his third and last voyage, landed at Nootka in 1778 staying there a month. Cook had with him two surgeons, Dr. William Anderson of the *Resolution*, and Dr. John Laidlaw of the *Discovery*. Dr. Anderson is mentioned frequently in Cook's journal as looking after the department of natural history and doing an uncommonly good job. He was sick at the time of the Nootka visit and four months after sailing for the north died of consumption off the Alaska Coast.

As a direct result of the publication of Cook's journal, many ships arrived at Nootka in the 1780's to hunt sea otter. Doubtless many of these ships carried surgeons, but only one of them will be noted here, Dr. James McKay, surgeon of James Strange's expedition from Bombay in 1786. On Strange's departure from the West Coast for China, McKay was left behind for the purpose of recruiting his health, as he had been very ill "with a purple fever." He was also required to learn the language and ingratiate himself with the natives so that if any other vessels should touch there he might prevent them from purchasing any furs. He was supplied with all necessities—food, clothing and blankets, garden seeds, grain, necessary implements of husbandry together with a male and female goat, as well as lavish gifts to Maquinna, the chief of the Nootka Indians. He had already gained the affection of the Maquinna family by the cure of the chief's child, who suffered from scabby hands and feet. Maquinna in turn promised that McKay should eat the choicest fish the Sound produced and that on return they would find him as fat as a whale. Instead of this, poor McKay was reduced to a daily meal of seven dried herrings' heads washed down with whale oil, was stripped of his clothes and obliged to adopt native dress. More than a year afterwards, Strange having failed to return, McKay was removed from Nootka by Captain Barclay, the Captain of the *Imperial Eagle*, who gave as his only reason that McKay had no right to monopolize the trade. Thus passed from sight the man who has been called by some the first resident practising physician on the Northwest Coast.

In 1789 the Spaniards stepped in, claiming Nootka as their territory and seizing several British ships. This Nootka incident very nearly precipitated war between Great Britain and Spain, but this was fortunately averted and Captain George Vancouver was sent out to receive the surrender of the territory from the Spaniards at Nootka. Vancouver had with him the usual quota of ship's surgeons and surgeons' mates as well as Dr. Archibald Menzies who was mustered in on board the *Discovery* among the "supernumeraries" as botanist. Cranston, the ship's surgeon of the *Discovery* took sick when the ships were rounding the Cape of Good Hope, and from that time on until the return of the expedition three years later, Menzies was ship's surgeon as well as botanist, and did his work so well that not one life was lost by sickness during this time. At every available opportunity spruce beer was brewed under his supervision—probably from western hemlock—with very beneficial effects on scurvy, very necessary indeed when the daily allowance of provisions for each man in the Navy at that time consisted of 1 pound of biscuits, 1 gallon of beer, 2 pounds of beef, or 1 pound of pork, or 4 oz. of cheese with 1 pint of oatmeal or half pint peas as a cereal, and 2 oz. of butter three times a week. No mention here of green vegetables or fruit. Menzies was born near Aberfeldy, Scotland, in 1754, and after leaving the parish school worked as a gardener until he went to Edinburgh to study medicine. He received his degree in 1781 and joined the Navy after practising a short time in Carnarvon. He came to the Pacific North West in 1786 under Captain Colnett in the *Prince of Wales*, calling at Nootka. Very little is known of this expedition as Colnett's papers were seized by the Spaniards. Arriving back in England Menzies joined the *Discovery* and came back to Nootka with Vancouver. He remained in the Navy for a short time after the return of Vancouver's ships, then resigned and took up the practice of his profession in civil life. He maintained his intense love of botany all his days and at the time of his death in 1842 was president of the Linnean Society.

(Incidentally, it is interesting to note that the pay of ships' surgeons in Menzies' day was £5 a month and in addition 2d per month from each man.)

As the sea otter of the West Coast steadily decreased in numbers owing to the ravages of the fur traders, so decreased the importance of Nootka as a port of call and as a base. It was, however, visited by Dr. John Scouler in 1825. He was ship's surgeon on the Hudson's Bay Company vessel *William and Anne* and a botanist of note. He was greatly interested in the Coast Indians, their ways and their diseases, but finally carried things too far. He stole three skulls from an Indian burial ground and barely reached his ship ahead of the natives.

Eighteen years pass with nothing to report until Fort Victoria was built in 1843 on the shores of the present Victoria Inner Harbour. Six more years go by, the H B C establishes its headquarters in Fort Victoria, to be followed by Vancouver Island becoming a Crown Colony and the first resident medical man of the Lower Island making his appearance. This was Alfred Robson Benson, a native of Whitby, Yorkshire. In his earlier days he had been captain of a vessel and so was nicknamed the "Commodore" by his fellow students at Guy's. He graduated from that school and landed in Victoria in 1849 from the *Harpooner*, taking up his quarters in "Bathelot Hall" in the Fort. Helmcken describes the surgery at that time as containing a gun case and a few shelves with drugs in bottles on a paper. The tin lining of a packing case served for a counter and there was a cot slung to the ceiling. Benson himself was described as a sterling, honest, kindhearted, upright man, always ready to do good, but somehow did not fit in. On Helmcken's arrival in 1850 Benson went to Fort Vancouver. In 1857, he reappeared again in the Colony, this time at Nanaimo, as the surgeon to the Vancouver Coal Company. He was the returning officer in the celebrated Nanaimo election to the Provincial Legislature in 1859, the candidate being Captain Swanson and Captain James Stuart the only qualified voter. The return mentions that Captain Swanson was duly elected by a majority of one! Benson shortly afterwards retired to England and died in his native town.

As mentioned previously, John Sebastian Helmcken arrived in Victoria in 1850 as colonial surgeon, and private secretary to Governor Blanshard. Much has been written about him so suffice it to say that he graduated at Guy's at the same time as Benson and Ash, and after two sea trips, one to Hudson's Bay, the other to the East, came to Victoria and spent the remainder of his life there, dying in 1920, full of years and honours.

Dr George Johnson came to Victoria on the *Tory* in 1851. He is entered as surgeon and clerk, and obviously was in the Fort for some time. In 1858 he was placed in charge of the "Royal Hospital" but soon departed for an unknown destination.

From 1858 on, arrivals became much more frequent. Four new names make their appearance in that year—Doctors Haggm, Baillie, Cleijon and Trimble. T B Baillie was a native of Lanark, an Edinburgh graduate and a cousin of Sir Mathew Begbie, the chief justice of British Columbia. In November, 1860, while on his way to Callao, Peru, he was washed overboard and drowned, 50 miles south of Cape Flattery, leaving several children and a widow who for many years kept a boarding house. Dr N M Cleijon, according to his own advertisements in 1858, was a native of Paris, a student of the Medical Academy and Clinique of Paris, had

practised a long time in China, where fevers, dysentery, rheumatism and other diseases were dreadful, and for the last 8 years in California. He had been "Medecin en Chef" of the French Asylum Benevolent Society of SF—treatment purely vegetable—in other words, without mercury. At one time Cleijon was fined £5 for the existence of eight stove pipes upon his premises contrary to law—a very puzzling matter to which I have found no answer as yet. From the time of his arrival to his death in 1864 at the age of 58, he was physician to the French Mutual Benefit Society, and was, as the obituary notice very smugly remarked, in very comfortable circumstances at the time of his death.

Dr James Trimble, born in Tyrone, Ireland, in 1818, after graduation, was a surgeon in the Royal Navy. He resigned his commission to go to California in 1849, practised there until 1858 when he came to Victoria. In addition to a large practice including much obstetrics, he was twice mayor of Victoria, was a member of the Provincial Assembly and later Speaker of the Provincial House. He died in 1885, aged 67 years.

From this time on arrivals were thick and fast. For the year 1862 alone I have been able to trace twenty-three names of doctors or quasi-doctors who at least started practice. I shall pick out a few about whom something is known.

Dr James Dickson, who arrived in 1860, was a member of the Legislative Assembly. He was appointed coroner for Vancouver Island but the appointment was revoked for some reason early in 1866. He evidently left the city soon afterwards. A dispatch from Portland, several years later states that he had had his jaw fractured by a thrown stone, inadvertently getting mixed up in a street brawl on the way home from the office.

Dr Israel Wood Powell was one of the most eminent men of his generation. He was born in Port Colborne Upper Canada, April 7 1836. He was tutored in Anatomy and Physiology by Dr Covernton, father of Dr C F Covernton, of Vancouver, and graduated from McGill in 1860. He intended to go to New Zealand but decided to take a look at Vancouver Island first, which he did, arriving in 1862 and settling there soon afterwards. In 1863 he was elected to the Legislative Assembly representing Victoria City and was appointed surgeon to the fire department and the following year surgeon to the French Hospital in place of Cleijon. He was Provincial Grand Master of British Columbia. Lieut-Col of the Victoria Militia, Superintendent of the Indian Department, Chairman of the Board of Education and was responsible for the introduction of the School Act, which established free schools in British Columbia. He was very strongly in favour of Confederation, delivered the first speech in its support, and in 1870 was one of the delegates sent to Ottawa to

arrange terms of union. For this he was offered a senatorship which he declined. In his later years his eyesight failed, and towards the end he was totally blind. He died in Victoria in 1915.

Walter Shaw Black was born in Bo'ness, Scotland. He held the degrees of M.R.C.S. and L.S.A.L.M. He served in the Crimean War, then went to Australia, received the degree of M.D. Melbourne, and came to Victoria in 1862, setting up practice in partnership with Dr. Turner. He soon left for the mainland, establishing himself in New Westminster, and became a member of the Legislative Assembly of British Columbia. He was killed in 1871 by a fall from his horse while hastening to perform his professional duties. His partner in Victoria, Dr. Turner, an L.R.C.S. of Edinburgh continued to practice there until in 1871, when two months after Black's accidental death, Turner, suffering from quinsy, took a dose of morphine from which he failed to wake up. He was the surgeon to the local Caledonian Society at the time of his death.

Dr. David Walker advertised first in the *British Colonist* in November, 1862 as "Surgeon and accoucheur. Pure vaccine matter always on hand. Dentistry, plate work on gold, platinum, rubber or silver. Teeth cleaned, filled or extracted." Prior to arrival in Victoria he had been surgeon of the *Fox* on the celebrated McClintock expedition which was the means of bringing to light so many traces of the fate of Sir John Franklin. He was obviously a man of parts, running a meteorological observatory in Victoria and supplying weekly observations to the newspapers. He left the city in 1865, joined the United States Army and when last heard of in 1871 was on his way to Washington to report as scientific officer of the United States Exploring Expedition towards the North Pole under Captain Hall.

Dr. William Jackson, born in Lincolnshire in 1835, came to the Colony in 1862. Shortly after arrival he was appointed Superintendent of the Royal Hospital at \$60 a month, a position he held until 1875. Later on he was Dominion quarantine officer, city health officer and coroner. He died in 1890 as a result of an accident in which he sustained a compound fracture of the femur.

Dr. John Chapman Davie Sr., was born in Lyme Regis, Dorset, in 1811. He arrived in Victoria in 1862 and continued in practice there until his death seven years later at the age of 58. He was a member of the Tariff Commission and a member of the Legislative Council. His son, Dr. J. C. Davie accompanied his father from England. Much has been written of him, so I shall pass on.

Dr. John Ash, born in Yorkshire in 1823, graduated from Guy's in the same year as Helmcken and Benson. Helmcken notes that he was a hard working clever man, noted for his short sight, tremendous breadth of shoulder

and chest and his short temper. He was a well read, and very sensible companion when in good humour, but if in a bad one people kept clear. When in practice he enjoyed some celebrity as an oculist. In addition he was a member of the Vancouver Island Assembly and after Confederation was provincial secretary for several years. He died in Victoria in 1886, aged 63.

Dr. Klein Grant arrived in Victoria on the *Rosedale* at the end of 1862. Grant was a graduate of Edinburgh, member of the Royal College of Surgeons of London and of Edinburgh, late senior physician to the Royal General Dispensary, London, and professor of the Practice of Physic in the Aldersgate College of Medicine, and Editor of Hooper's Medical Dictionary. Report also has it that he was editor of *The Lancet*, but I hardly think that this can be correct, as Wakley, the founder, owner, and editor of *The Lancet* was alive at that time. Grant remained in Victoria for about two years, then transferred his allegiance to Nanaimo, where he spent the remainder of his days, dying in 1873 at the age of 68.

Dr. McNaughton Jones, a native of Cork, Ireland, also came out in 1862, practising successively in Victoria, New Westminster, Nanaimo and again in Victoria. He subsequently became Dominion Health Officer and quarantine inspector for the Province.

I cannot pass on from the year 1862 without noting Dr. J. Nicholls, not that he was outstanding as far as we know, but was a doctor who came to a new town and a new life at the age of 72 and remained in practice until his death nine years later.

Dr. R. W. W. Carroll, born in Woodstock in 1839, educated at Trinity College and McGill, received his degree in 1859. He practised in Canada for a short time, then joined the Union Army as surgeon. Following 3 to 4 years' service he came to the coast, settling first in Nanaimo, then in the Caribou. He represented Caribou on the Legislative Council of British Columbia from 1868, and in 1870 was appointed one of the delegates to negotiate terms of union with Canada. For this he was appointed Senator in 1871. He died at Woodstock in 1879.

So much for the regular medical practitioners. The remaining medical men in the Colony can be divided into three groups: (1) Medical graduates in business. (2) Quacks and fly-by-nights. (3) Unfortunates.

Of the first group William Fraser Tolmie is much the most prominent. In addition there is John Frederick Kennedy, surgeon and chief trader of Hudson's Bay Company who came to Victoria in 1851, and the following year was placed in charge of gold mining operations in the Queen Charlotte Islands. In 1857 was member from Nanaimo in the Provincial Legislature. He died in Victoria in 1860. Dr. H. A. Tuzo was born in Quebec, studied at McGill, obtaining his degree in 1853. He then signed on

with the Hudson's Bay Company as surgeon for 5 years, the major portion of which was spent at Fort Vancouver. At the end of 5 years he signed on as a clerk in the company's service and came to Victoria where he remained for many years, becoming eventually a bank manager. He finally moved to England where he died.

Quacks and fly-by-nights—There were quite a number of these gentils, but two examples will suffice. Dr C H de Wolfe, first noted in October 1862, as guaranteeing cures in all curable stages of disease "No matter how bad your case or what the name of the malady. Call and learn his mode of treatment and then judge for yourself. Consultation free." His treatment apparently was herbal, chiefly lobelia as well as baths, as he boarded patients in his bath house. One of his last acts in Victoria was to sue the estate of a patient, an alcoholic and dope addict, for \$240.00 due him for board, lodging and treatment. During the course of his testimony he made the statement that the deceased was the 150th patient of his who had died by his own hand. Later on in the proceedings Dr de Wolfe addressed the jury in his own behalf at great length, handling the solicitor for the defense without gloves and making a most ferocious onslaught on Drs Haggin and Dickson, especially the latter and on the faculty generally, "who bled and blistered, starved and killed one out of every ten of their patients." He left town within two months of this episode, and next year was lecturing to San Francisco school children on health laws, and later on, on physiognomy.

The other to be noted went by the name of Dr J Flattery. Just listen to this "puft" dated June 12, 1862. "The afflicted will now have an opportunity of consulting Dr J Flattery, the highly recommended and distinguished physician and surgeon from San Francisco. He will remain at the Colonial Hotel in this city but a few days, previous to his return to San Francisco. The Doctor is a graduate of medicine and a literary gentleman and we certainly hazard nothing in commending him to the suffering portion of our community. He presents testimonials of the highest respectability as to his skillfulness, and is provided with the latest and most improved instruments as aids to his profession. His newly invented stethoscope for the examination of the lungs is a most decided improvement on the old. Also his laryngeal speculum (a concave metallic mirror) a most valuable instrument which prepares him to convey light within the throat sufficient to expose to view its disease", etc. Flattery apparently found the pickings good as he was still in town advertising in October. By December 3, 1862, we find the following in the *British Colonist*:

"Quack Flattery, who disappeared after 'doing' several people or borrowing money from coloured boot blacks without recollecting to pay it back, is certainly capable of carrying off the palm for impudence. Here

before we had not thought the fellow's departure worthy of notice, although it did look like petty larceny, but the subjoined letter, received by mail yesterday, gives his measure pretty fully.

"Portland, 25th November, 1862
'Editor, *British Colonist*

Sir

When I visited Esquimalt for the purpose of sending my wife and children to this place, I intended returning to Victoria at the departure of the steamer, but by a misunderstanding was unexpectedly carried to sea and therefore am unexpectedly here. I will return to Victoria and settle up accounts about next Tuesday a week. Your account, I believe, is \$6 which will forward perhaps earlier that time.

Your etc

Dr J Flattery

P.S. If I see any impudence in your journal relative to my unfortunate departure, I will never pay you and therefore serve you right."

The last group, the unfortunates—by this I mean of course the chronic alcoholics and men of that ilk. For a town that was the base for gold mining ventures, the number was surprisingly small, and even more so when we consider that there was no medical aid and no college to advise, admonish or adjudge. In all, during the period under review, there are only three names that crop up regularly in the police court records.

HOSPITALS

In 1855, during the course of the Crimean War, Governor Douglas was asked by Rear Admiral Bruce of the Royal Navy to erect hospital buildings, as many casualties were anticipated during the second assault on Petropavlovsk. This was done, three wooden buildings being erected at Duntze Head at a cost of £932, 5/. Each of the interconnected buildings was 30' x 50'—had 12' ceilings and large windows. There was an operating room, kitchen, apartment for the surgeon in charge, while the two wards were capable of accommodating 100 patients. As it happened there were no casualties as Petropavlovsk was found abandoned. The buildings were taken over by the Admiralty in 1857 and used intermittently. In 1862 the barracks of the Royal Engineers in Skinner's Cove were transferred to the Navy for a hospital together with 10 acres of land.

The following quotation describes the first civilian hospital in Victoria:

"15th December, 1858. The British people have ever been distinguished by the largeness of their humanity, their practical disposition to succor the distressed, comfort the sick and 'bind up the broken heart.' As an instance in point, we learn that through the exertion of the Rev Mr Cridge and Mr Commissioner Pemberton, a public hospital has been established in the Washington House, Broad Street, and placed under the charge of our well known townsman Dr Johnson. There are now 7 patients under treatment. The building is unsuitable for a permanent hospital, the walls so thin that Indians have broken through and stolen the victuals set for the sick."

Three months later a site for a new hospital had been selected on the Indian Reserve front-

ing the harbour. The Governor had granted the use of the land and appropriated \$2,000 for the building of the hospital. From the very beginning the institution was overcrowded and beset with financial difficulties. In August, 1860—"all the beds of the establishment are in use, and there is no straw on hand with which to fill others. Relief is loudly called for and it is to be hoped, will be freely rendered by our citizens." July, 1861—"Royal Hospital—several destitute patients in the hospital are greatly in need of clothes, cast off linen and other garments and bundles of old linen for dressing wounds, etc., sent to the Steward of the hospital will be thankfully received." And again in September, 1862—"At this institution there are at present writing 27 patients, 9 more than the capacity of the building will accommodate with any degree of comfort. Several of the patients are lying on 'shakedown' or mattresses and blankets spread on the floor. The state of the hospital finances is extremely difficult to arrive at since Owens stole the £233 belonging to the fund and 'clatawaed' to Caribou but there is no doubt that matters, in a deplorable condition before, are in a far worse condition now." In time, however, the hospital weathered the storm, although apparently was never out of debt.

In the meantime two other institutions appear on the scene, the first the French Hospital, built in the latter part of 1861 where the old nurses' home of St Joseph's Hospital still stands. The second, the Female Hospital, commenced in November, 1864, on the site of the Christian Science Church. This building measured 75' x 71'. It had a verandah all around, had a large sick ward with 8 beds, a receiving ward, lying-in ward, inspection room, matron's room, 2 private rooms, dining hall, kitchen and bath room for hot and cold baths.

The Royal Hospital and Female Hospital went their respective ways until 1869, when the Female Hospital was taken over by the Board of the Royal Hospital. The Royal Hospital itself was abandoned and the inmates of both institutions housed in the Female Hospital, which was renamed the Royal Hospital, continuing to give woman service to the community up to the time the Provincial Royal Jubilee Hospital was built twenty-three years later.

If professional secrecy was observed by individual doctors, it certainly was not observed by the Royal Hospital in its early days. The *British Colonist*, of July 3 1860, had a long leading article on the hospital, in which it gave the number of patients who had sought relief at the hospital from the day it first opened, a period of eighteen months. There then followed the names, ages, diseases and nationalities of the deceased patients. It almost goes without saying that some of the diagnoses are still not mentioned in polite society.

1029 Douglas Street

SOME REFLECTIONS UPON THE HEALTH AND MORTALITY OF COTTON TEXTILE WORKERS

By C L Roman, M D

Valleyfield, Que

The basis for this survey is the life history of 205 individuals, male and female, who have reached or passed fifty years of age, and have worked from 13 to 54 years in the environment of cotton textiles. I have had the benefit of the close observation of these people that comes with the workaday experience and insight of a medical man who was conversant for more than 16 years with the industrial, medical, and personal problems to whose solution I have made my slim contribution as a joint partner.

At the outset, the objection will be made that this company of 200 is not sufficient upon which to base conclusions in a plant that has been in operation for more than seventy years, that this number does not truly designate the index of turn over. But against this apparent defect can be placed the unvarying condition of locality and the prevailing and unchanging type of worker. No more representative cross section could be found in the cotton business than this group whose activities have been connected with some phase in the production of cotton. Executives, office-men, cotton sorters, spinners, weavers, dyers, bleachers, nappers, mechanics, painters, carpenters, male and female, French Canadian and English, all more than fifty years of age, present a set of vital statistics whose study becomes interesting and instructive when considered in the light of the possible hazards that might accompany the fabrication of cotton textiles.

For convenience, the essential facts, from which are drawn the comments and summary of this paper, can be compressed into a paragraph.

Two hundred and five workers in the cotton textile industry were chosen in the 25 year range from 50 to 75. These are classified in three groups representing 50, 60, and 70 years. There were five in the oldest set, the average age being 71.6 years, and constituting 1+ % of the aggregate number, while those in the 60 group showed an average of 60.7 years, and with 60 such made up little more than 28% of the total while the youngest set numbered 140 of about 70% and the mean age was 54.3 years. After 7 years, 120 or 63% are still working at The Montreal Cottons Limited, 19, or 9% are dead, 11, or 20% are retired, and 16, or 7.8% have left employment. Of this latter 16, one was 75, three were in their sixties, and twelve in their fifties. One of the original five in the seventies is alive. The 19 dead all reached late sixties and early seventies. Of the 10 women, whose ages ranged from 50 to 64, one is dead, five have retired, and three are still working, the oldest of this trio now being 65 years of age and having 50 years of service, the remaining two being 59 and 55, having 36 and 27 years of service, respectively. In the female group, all had passed the menopause, 2 being married, 2 widowed, and 6 spinsters.

* Physician to The Montreal Cottons Limited

edge of Lake St Francis has grown into the largest cotton mill under one roof in Canada. Here more than 3,500 male and female employees spin, weave, bleach, dye, and finish many hundreds of various kinds of cloth from the finest nanosook and finest gauze to coarse canvas and heavy tapestry, to say nothing of a staggering variety of goods for military purposes. Among the several departments already listed, there is a good-sized and well-equipped first-aid hospital where three physicians and a nurse treat annually between 10,000 and 15,000 medical and surgical patients.

Many years of contact with this small army led me to speculate upon its general health and longevity, its habits, its resistance to illness, the diseases to which it was liable, the conditions under which it lived and worked, and the relation of these factors to each other. Among this group of 205 were a number who had been working in the mill before I was born and long before I had entered upon the study of medicine. Slowly it occurred to me that here was a throng, the survey of which would provide some revealing figures and a few interesting facts. One authority has aptly written—"There is probably no industry today that we know less about in its effects on health and longevity than the textile industry, of which the cotton industry is a principal part."

Before making a short résumé of the medical findings, a more complete picture could be visualized if a look were cast at the racial and environmental background of these individuals. Predominantly French Canadian in stock to the extent of 85%, these study people had come almost directly from the farm, while the remaining 15% was of pure old-country Anglo-Saxon ancestry. A large percentage own their houses, which were models of comfort and cleanliness and bespoke thrift and a high standard of living. The journey away from the grim and spectral squalor of their spiritual ancestors of a century ago had been long and tedious.

It is safe to say that 98% of the men use tobacco and that 90% took alcohol moderately, usually as beer. Then, habits were extremely regular and meals were eaten at the same hour daily meat being served in most cases for the three meals. The retiring hour, save on Saturday nights, was invariably no later than ten, in order to rise at five thirty the following morning, when the first mill whistle blew. The work period began at seven and ended at six. In very few exceptions schooling had ended between ten and twelve, but there were only a small number who could not read or sign his name. They were short on general knowledge, but what mattered most, long in wisdom, and rich in understanding. Only one man was frankly below par, mentally.

The medical notes command attention. The average height was that which goes hand in hand with energy—5' 5". A height of 5' 8" or more was so unusual as to be rare while only one worker measured 6' 1". The shortest individual was 4' 11". The general weight was quite ideal according to the theoretical chart, being 150 pounds the maximum and minimum weights were 253½ lb and 98 lb, both women. There were 15 who weighed 200 lb or more. The blood-pressure findings were in keeping with those found in extensive cotton textile researches made by the US Public Health Service—on the low side, in the main, the readings were well within normal limits but there were of course extremes, the highest being found in a woman who had a hypertension of 250/150, while the lowest was 100/60. Seven had a systolic of 200 and over.

The information concerning cardiac wear and tear paralleled the vascular data in that two were found where definite organic changes existed, one with a systolic murmur, one with a diastolic, while several had extra-systoles, myocardial enlargement in many with no embarrassment was noted. No laboratory test was resorted to beyond that of urinalysis, from which it was learned that 11 showed diabetes or slight traces of albumin.

It was to be expected that accidents had taken their toll as contact with machines thirty or forty years ago was not as happy as today. It was found that 40 had suffered injuries that were graded from an amputation of the arm to the loss of fingers, or mutilation of the hands. Twenty-six had undergone operations, among these being one prostatectomy, two thyroidectomies, several appendectomies and herniotomies. Two had had a gastro-enterostomy for duodenal ulcer, one of which had perforated, and the other had had this radical measure carried out after two years of medical treatment. One hydrocele was discovered and two had an inguinal hernia of many years' standing.

This survey leads me to believe that there is no industry that has less hazard and less occupational disease than is found in the production of cotton. The health and longevity of its workers compare more than favorably with that of other industries. It has been my experience to follow great numbers who have retired from active work and I have observed that, as a rule, their lives are prolonged into the sixties and seventies, where death occurs from sudden cardiac failure or from cerebral accident.

These findings are to be taken more as suggestive than conclusive. It is believed however, that the cotton industry of today has been rid of the hazards of half a century ago or less. In those days, tuberculosis, bronchitis and asthma were the diseases mostly found in connection with this branch of the textile industry, but

through improved lighting, more scientific humidification, better ventilation and sanitation in the way of cleansed air and suction of dust, more even heating of rooms, these evils have largely disappeared. It is also felt that regularity of hours is conducive to a slower and more steady expenditure of vital reserve, which to my mind is the all-important essential in an heredity that is vigorous and robust. Longevity is the result, if that vital capacity is not too rapidly expended.

The cotton industry has emerged from the dark ages of the industrial revolution, bringing with it a different and better standard of living, and assuring the survivors of years of hard work, and a happy, healthy old age into which they can retire through the aid of pension and by virtue of splendid heredity and by means of a slow and safely dissipated vital energy.

This study has been made possible by the co operation and courtesy of Lieut Col W G E Aird, Managing Director of The Montreal Cottons Limited, I also received encouragement from the late Professor L J Rhea.

ASSOCIATION NOTES

R C A F Benevolent Fund—Medical Treatment

The R.C.A.F. Benevolent Fund was created from the voluntary contributions of R.C.A.F. personnel, interested civilians and canteen profits at R.C.A.F. units. Its

purpose is "To relieve distress and promote the well being of R.C.A.F. and Ex R.C.A.F. personnel and the dependents of both." The Fund is registered under the War Charities Act.

Many applications handled by the Fund deal with accounts for medical treatment. Therefore it is felt advisable to acquaint the members of the medical profession with the procedure used in dealing with these cases. The Fund is pleased to assist applicants in need for assistance is found to exist after an unembarrassing investigation is undertaken by the Fund's local representative. Where a case which appears to warrant assistance from the R.C.A.F. Benevolent Fund comes to the attention of a physician, the matter should be referred to the local representative, or directly to the head office at Ottawa. If possible, such reference should be made early in the course of treatment or investigation.

After consultation with the Canadian Medical Association, the Fund has decided to settle accounts rendered for these patients in accordance with the scale of fees approved by the Department of Veterans' Affairs.

Where it is indicated that a patient may require assistance he or she should be cautioned as to the type of service requested, as the Fund must necessarily limit its aid to non-luxuries. Unless a doctor's certificate is furnished confirming the necessity of other than public ward accommodation, assistance will be restricted to public ward rates. The same principle applies to the hiring of special nurses. Where applicants can avail themselves of public clinical treatment, they should be encouraged to do so, as assistance from the Fund in these cases will normally be restricted to the nominal fees charged by such clinics. In all cases the applicant will require a detailed statement of account for attachment to his application form. The same terminology as in the D.V.A. scale is to be used.

ADDRESSES OF R C A F BENEVOLENT FUND REPRESENTATIVES

<i>County or District</i>	<i>City</i>	<i>Representative</i>
PRINCE EDWARD ISLAND		
Queen's	Charlottetown	H C Bourke, Carvell Bros
King's	Montague	A F Campbell
Prince	Summerside	Dr J C Simpson
NEW BRUNSWICK		
Gloucester	Bathurst	J E Connolly, M L A
Restigouche	Campbellton	J W MacDonald
Madawaska	Edmunston	E W Ross
York, Sunbury, Queen's	Fredericton	K L Golding, 828 Brunswick St
Northumberland, Kent	Miramichi	Hon G P Burchill, LL D, Senator S Nelson
Westmorland, Albert	Moncton	G Filiter, Mgr, Bank of Montreal
St John, King's	St John	Harold G Ellis, Irving Oil Co
Charlotte	St Stephen	R C Peacock, c/o Messrs Clark and Sons Ltd
Sussex	Sussex	Mrs J E Keith
Carleton, Victoria	Woodstock	Cecil E Stewart
NOVA SCOTIA		
Annapolis	Annapolis Royal	Lieut Col E K Eaton, Hon Superintendent, Fort Anne National Historic Park
Halifax District and Lunenburg	Halifax	J R MacLum, O B E, Manager, General Trust and Executor
Annapolis Valley, Digby, Annapolis, Kings and West Hants	Kentville	F J Burns, Editor, Kentville Publishing Company
Eastern Nova Scotia, Pictou, Antigonish, Guysborough	New Glasgow	Mr F H McNeill, Warden, Municipality of Pictou, RR No 1
Central Nova Scotia, Colchester, Cumberland, East Hants	Stewiacke	F W Young, c/o J Lewis & Sons, Ltd
Cape Breton Island	Sydney	Dr James Bruce 47 Whitney Ave
South West Nova Scotia, Queen's, Shelburne, Yarmouth Counties and Clare	Yarmouth	P G Boutlier, Boutlier, Prosser & Prosser, Water St

QUEBEC

Amos
Arthabaska
Chicoutimi, Kenogami, Arvida
Baie Comeau
Brome, Missisquoi
Gaspé
Grand Mere
Lake Megantic

Matane
Montmagny
Montreal Island

Charlevoix
New Carlisle
Noranda
Percé
Quebec City and Lévis
Rimouski
Rivière du Loup
Roberval
Shawmigan Falls
Sherbrooke
Terrebonne

St Joseph de Beauce
St Johns
Three Rivers
Valleyfield and Beauharnois
Val D'Or

Amos
Arthabaska
Arvida
Baie Comeau
Cowansville
Gaspé
Grand Mere
Lake Megantic

Matane
Montmagny
Montreal

Murray Bay
New Carlisle
Noranda
Percé
Quebec
Rimouski
Rivière du Loup
Roberval
Shawmigan Falls
Sherbrooke
St Agathe Des Monts
St Joseph d'Alma
St Joseph de Beauce
St Johns
Three Rivers
Valleyfield
Val D'Or

Emile Montambault
Maurice Michon, Sheriff, Court House
G La Mountain, c/o Aluminum Co of Canada
Arthur Sewell
Ralph Stockwell
Henry Beshirvase, Battery Park Hotel
Alpheda Crete, MP
G M Stearns, President, Lake Megantic Pulp and Paper Co
Roual Laford
Philippe Bechard, c/o Cie Belanger Ltée
W S Phillips, Room 20, 1st Floor, 1499 St Catherine St W
Henri D'Auteuil
John Shechin, KC
Lucien Labelle, KC
Mrs Renouf, c/o Robin Jones & Whiteman
Hon Mr Justice A Savard, Court House
The Hon Jules Brilliant, MLC
Leo Berube, KC
Roual Boissonault, Prothonotary of the Superior Court
D R Wilson, Shawmigan Standard
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Gavin Power, MP
G J Taylor
Dr R L Anger
Miss and Mrs Yvan Sibonrin
Fringois Lajoie, KC
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Eugene Oumet

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Muskoka
Brant
Peel
Leeds
Kent
Cochrane
Dundas, Stormont, Glengarry
Huron
Wellington
Wentworth
Kenora
Lennox, Addington, Frontenac

Waterloo
Victoria, Haliburton, Durham
Middlesex
Simcoe
Welland (north)
Nipissing, Parry Sound
Halton
Carleton, Russell, Prescott,
Hull, Que

Ontario
Bruce Grey
Renfrew
Lanark, Grenville
Peterborough
Thunder Bay, Rainy River
Renfrew
Lambton
Algoma
Lincoln
Elgin
Perth
Sudbury
York
Welland (south)
Essex
Oxford

Belleville
Brimbridge
Brimford
Brampton
Brookville
Chatham
Cochrane
Cornwall
Godenich
Guelph
Hamilton
Kenora
Kingston

Kitchener
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Niagara Falls
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Pembroke
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Sarnia
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St Thomas
Stratford
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Windsor
Woodstock

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A P Waters, KC Barrister
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H L Wright, c/o Dr and Rankin Barristers, 69
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J M Cowan Editor, Niagara Falls Evening Review
D Jones Williams Mgr Bank of Commerce
W B E Reide, Manager Bank of Montreal
Ernie Taylor, OBE, 76 Clarendon Ave

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D P Jameson, MBE, KC, Box "P"
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M A Seymour, 2 William St
G Percy Sprackman, 329 Tilbot St
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E D Wilkins
W R Kingsland, 31 Willocks St
G E Nash, 100 Merrit St
F Lorenzen, 310 Canada Bldg
Harold Utting, 505 Dundas St

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Dauphin
Flm Flon
Morden
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H B Smith Ross Ave
Alex Katz, K C
R M McIsaac
W L Breakey c/o Dom Experimental Farm
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Swift Current
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T G Ross
H A Westergard
George Harrower
J L Blith
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Red Deer
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J W E Markle
James Walker, OBE, Manager, Canadian Bank of
Commerce
N J Swallow, c/o Thompson Hardware Co
A G Brahm MBE, 317 7th St South
W Lingings, Canadian Bank of Commerce
A Phinister
H J Snell
W W Shupe

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Atlin
Chilliwack
Courtenay
Dawson Creek
Fernie
Kamloops
Kelowna
Nanaimo
Nelson
New Westminster

Oceana Falls
Port Alberni
Powell River
Prince George
Prince Rupert
Princeton
Revelstoke
Trail
Vancouver
Victoria

Harry Day, c/o Day Rock Farm
R D Nelson, Postmaster
P J Keoughan, Veterans' Officer, Box 20
R N Carey, P O Box 39
M A Van Roggen, Box 1134
A L Ross Canadian Bank of Commerce
J C Stanton, 469 Victoria St
C E R Bazett, Box 1574
B S Abrams, c/o Customs and Excise Div
Miss Leona Boss, 913 Hall St
Kenneth MacKenzie, c/o Mutual Life Ins Co 38 Begbie
Street
F Oxenbury, c/o Pacific Mills Ltd
Allen Wile, c/o Bank of Montreal
Myron McLeod, c/o McLeod Amusements Ltd
G Milburn Government Agent
John S Wilson, P O Box 736
Charles J Harman, Veterans' Officer
W J Johnson, P O Box 486
Major P Matheson, Post Office Building
Clarence Wallace, OBE, 720 Howe St
W Hobart Molson, 412 Post Office Building

PERITONIAL GLOVES IN PRIMITIVE SURGERY—Group
Captain G Struan Marshall writes from Edinburgh
(Brit M J, June 15, 1946) Dr A R Estes mentions
the use by Arabs of ants as Michel clips. There will
be found, in a book written about twenty years ago—
Secrets de la Mer Rouge by Henri de Monfreid—and
published, I think, in Paris, a fairly detailed account
by an intelligent human of an operation in the Sinai
Desert that should still further amuse Dr Estes's
virtuosi. De Monfreid seems to have been a pearl fisher
in the Red Sea, intermittently dodging those who would
interfere with his apparently nefarious trade. He writes
of an occasion when he had landed and gone up country,
a tribesman was brought in, suffering from a deep spear
wound of the belly. After some delay a native
"doctor" appeared and gave the injured man something
to suck that seemed to blunt his sensation. Then he
examined the wound, and got an acolyte to hold it open.

He extended the wound with a blade dipped in very
hot melted butter, and exposed the stomach, which had
been penetrated by the wounding spear and was gaping.
He now had a goat killed and its belly opened, he
extracted the omentum and draped it over his hands
and with these natural gloves handled the stomach.
Holding the cut edges of the stomach wound together,
he took a large ant from a vessel, held it just behind
the head, and brought it to the approximated edges
of the wound, when the ant's mandibles closed firmly
on them. At this moment he brought his nails together
nipping off the ant's head, which remained clamped to
the cut edges, holding them together securely.
I write from a tenuous memory, and may have
got minor details slightly wrong, but I am sure of the
major ones and can only wonder at so modern a
development of surgical technique in a country where
communication is difficult and scanty. *Ex Africa semper
aliquid novum*—well, not quite Africa but near enough.

UNIVERSITY NOTES

University of Western Ontario, London

REFRESHER COURSE IN INDUSTRIAL MEDICINE

On October 18 and 19, the University of Western Ontario London, in conjunction with the Section of Industrial Medicine of the Ontario Medical Association will hold a refresher course in Industrial Medicine at the Medical School. This course will be of interest to physicians working in industry and general practice.

A fee of \$5.00 is being charged by the Section of Industrial Medicine to defray expenses. As the number that can be accommodated is limited, it is advisable to register as soon as possible with Dr C S Ward, 241 Queen's Avenue, London, Ontario.

On the afternoon of October 19, McGill plays Western at Little Stadium, London. Tickets for this game are available to those who wish to attend.

PROGRAM

October 18, 1946

MORNING SESSION

- 9 00 a.m.—Registration
- 10 00 a.m.—Research in Aviation Medicine and Application to Industrial Medicine. Dr G E Hall Dean, Faculty of Medicine, University of Western Ontario, London
- 11 00 a.m.—Back Strain in Industry. Dr Robert J Galloway, Toronto
- 12 00 noon—Fallacies and Control of Respiratory Infections with Special Emphasis on Influenza. Dr F S Brien, Professor of Medicine, University of Western Ontario, London
- 1 00 p.m.—Luncheon

AFTERNOON SESSION

- 2 00 p.m.—Psychoneurotics vs Early Mental Disease. Dr G E Hobbs, Professor of Clinical Preventive Medicine, University of Western Ontario, London
- 3 00 p.m.—What's the Use of Records? Dr Win T Fulton, General Motors Corporation, Detroit, Michigan
- 4 00 p.m.—Early Signs and Treatment of Rheumatic Conditions. Dr G Douglas Taylor, Toronto

EVENING SESSION

Dinner (place to be arranged)
Guest Speaker: Dr L G Rowntree, Philadelphia, Pa. (subject to be announced)

October 19, 1946

MORNING SESSION

- 9 00 a.m.—How to Use Plaster. Dr A D McLachlin, Professor of Surgery, University of Western Ontario, London
- 10 00 a.m.—Health Education in the Bell Telephone Company. Dr W H Cruickshank, Medical Director, the Bell Telephone Company, Montreal
- 11 00 a.m.—Fractures. Dr E C Steele, Medical Officer, Workmen's Compensation Board, Toronto, and Dr W C Kruger, Radiologist, Toronto Western Hospital, Toronto

MISCELLANY

War Losses

BRITISH EMPH

The military losses of the United Kingdom during the last war amounted to 261,400 (including deaths from wounds and fatal accidents), and 53,000 missing. Some of those classified as missing may be presumed to have been killed.

If deaths due to natural causes are omitted, the losses sustained by crews of British merchant ships amounted to 30,200 dead and 5,260 missing.

Of the civilian population of the United Kingdom nearly 60,600 were killed, including 25,400 women and 7,700 children under 16 years of age.

The total losses due directly to the war therefore amounted, for the United Kingdom alone, to nearly 400,000 persons.

The following figures show, in addition, the total number of persons killed and missing for other parts of the British Commonwealth: Canada 39,300, Australia 29,400, New Zealand 12,200, Union of South Africa 8,700, India 36,100, Colonies 21,100.

ARMY CASUALTIES DURING DIFFERENT WARS

United States—Whilst the Mexican War (April, 1846 to February, 1848) was responsible for only 13,000 deaths—nearly 11,000 of which were due to disease—the Civil War (April, 1861 to April, 1865), which cost the United States more lives than any other war, caused about 620,000 deaths, 360,000 for the North and, very approximately, 260,000 for the Southern States. As may be seen from the following examples disease accounted for more deaths than did the actual fighting in the various wars which took place in the 19th century.

	Deaths due to	
	fighting	disease
Mexican War (1846-1848)	1,560	10,980
Civil War (1861-1865) (North)	111,760	233,790
Spanish American War (1898)	380	4,800
Philippine Insurrection (1899-1902)	1,000	4,570

The situation was very different during the last two world wars. In spite of the influenza epidemic of 1918, the number of deaths due to disease during the years 1917 and 1918 was almost the same as the number of battle deaths. During the last war, the situation may even be said to have been completely reversed. As a result of systematic preventive vaccination and the use of new products such as the sulfa drugs and penicillin and of DDT insecticides deaths due to disease fell to a very low level. The large scale epidemics which were a feature of previous wars were so to speak banished.

	Deaths due to	
	fighting	disease
First World War (1917-1918)	51,260	51,150
Second World War	217,000	13,700

The progress which has been made is also illustrated by the fact that the proportion of deaths from wounds has continued to fall.

	Civil War (North)	1917-18 War	1941-45 War
(a) Killed in the fighting	69,980	37,570	190,500
(b) Deaths from wounds	44,780	13,690	26,500

Thus, the number of wounded who died of their wounds amounted to 39% of all the deaths due to the fighting during the Civil War, to 27% in 1917-18, and fell to only 12% in 1941-45.

* Taken from the League of Nations Monthly Bulletin of Statistics, No 5.

Harvey and the Battle of Edgehill

William Harvey is said to have been present at the Battle of Edgehill and, according to the legend, the King entrusted his two young sons the Prince of Wales and the Duke of York, to the care of that eminent physician. The originator of this yarn was John Aubrey, gossip writer and a charming man, who had only one enemy—himself. He was unreliable, as gossip mongers have been throughout the ages. The tale originated by Aubrey runs as follows:

"When Charles I by reason of the tumults left London, he [Harvey] attended him and was at the sight of Edgehill with him and during the fight the Prince and Duke of York were committed to his care. He told me that he withdrew with them under a hedge and took out of his pocket a book and read, but he had not read very long before a bullet of a great gun grazed on the ground near him, which made him remove his station."

This anecdote, which has not a shred of evidence to support it, has been repeated by many of Harvey's biographers, and some of them have even elaborated on it. One says that the book he was reading was Fabricius;² another states that Harvey was nearly hit by the cannonball, while a third has it that the doctor and the boys had been for a walk and were tired of waiting for the battle to begin, so they sat down in a ditch to pass the time.³ An artist, W F Yeames, has depicted the incident in an oil painting which was reproduced in Ogle's *Harveian Oration* of 1880. This pictures to us the battle in progress in the middle distance. The young princes are crawling up the bank to get as good a view of the fight as possible. The great man himself is seated on the trunk of a fallen tree at the bottom of the ditch, entirely engrossed in the book which he is reading, and he has a second book on his knee. Artistic licence is pardonable in a punter, but is inexcusable in an author such as Eliot Warburton, who is claiming to write history. In his *Memoirs of Prince Rupert* (Vol 2, p 17) he writes

"Whether he [Harvey] was absorbed in the contemplation of his favourite subject [the circulation of the blood], under favourable circumstances or not is uncertain, but he lay upon the hill side, apparently unconscious of the roar of battle from beneath and of bullets plunging into the turf all round him, until he was furiously carried off the field by someone who cared more for him than he did for himself."

All very dramatic, but there is not a word of truth in the whole story. If Aubrey's story had stood alone, it would have had to be accepted for want of any other evidence. Fortunately, evidence is available which shows that the young princes were very differently employed that day. First of all, there is the statement of an anonymous writer who, there can be little doubt, was present at the battle, that the cannonade at the start of the fight did little damage, but that a number of cannonballs fell near to where the King and his children were located,⁴ and this was certainly not in a ditch at some distance from the battle. The story is carried forward by no less a person than the Duke of York himself. He informs us⁵ that the King did not wish to expose his brother and himself to these dangers, and asked first the Duke of Richmond and then the Earl of Dorset to take the boys away from the battlefield. Both these noblemen asked to be excused, as they felt it would be cowardly for them to withdraw while the action was in progress. The King finally gave a direct order to Sir William Howard to remove the children. As they were retreating they were nearly captured by a party of Parliamentary horse, which had come round the left flank of the Royalist infantry. Fortunately, a dressing station had been opened in a barn in this area and

a number of Royalist wounded were congregated around it. The enemy cavalry, mistaking these men for a formed body of troops, retired, which gave the princes their chance to escape.

Here are two independent accounts of what happened to the King's sons upon that memorable day, both accounts are in agreement with each other and completely contradict Aubrey's romantic little story.

SIR JOHN HINTON'S ACCOUNT

There is still a further witness, Dr Hinton, later Sir John Hinton and physician to Charles II. This distinguished doctor had cause to petition His Majesty after the Restoration. In the course of this document Hinton recalls his services at Edgehill, where he appears to have been employed in the intelligence branch of the army and not in the medical one, as might have been expected. He says:

"Your majesty [Charles II] was unhappily left behind in a large field, at which time I had the honour to attend upon your person, and seeing the sudden and quick march of the enemy towards you, I did with all earnestness most humbly, but at the last somewhat rudely, importune your Highness to avoid the present apparent danger of being killed or taken prisoner, for their horse was by this time come up within half musket shot in a full body, at which your Highness was pleased to tell me you feared them not and drawing a pistol out of one of your holsters and spinning it, resolved to charge them, but I did prevail with your Highness to quit the place and ride from them in some haste, but one of their troopers being excellently mounted, broke his rank and coming full career towards your Highness I received his charge and having spent a pistol or two upon each other, I dismounted him in the closing but [he] being armed cap à pie, I could do no execution on him with my sword, at which instant Mr Mathews, a gentleman pensioner, rides in and with a poleaxe immediately decides the business and then overtaking your Highness, you got safe to the royal army."

This extract has been given at length because, if true, it completely demolishes the legend of Harvey acting as the guardian of the princes at the Battle of Edgehill. There appears to be no reason why Hinton's account should not be accepted. It corresponds with the one given by one of the principal actors, the Duke of York. Both agree that the incident took place on the left wing of the Royalist army, that the Prince of Wales ran a grave risk of being cut off by the enemy's horse, and that he was saved only by the fact that they did not charge as a formed body.

Further, dare Hinton have invented such a story? Surely he would not have taken the risk of being exposed as a vulgar liar by his royal master. True, the event had taken place years before, when Charles was only thirteen and his brother James nine. But every incident of his first battle must have been firmly imprinted on his mind. Also, the story can hardly have been invented to flatter Charles II, since it shows him acting rather foolishly and being told so by an older and more experienced man.

D STEWART, D.Sc. MRCS

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Anatomy Department,
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*From *Nota et Vetera Brit M J*, May 25, 1946

CANADIAN MEDICAL WAR SERVICES

MEDICAL OFFICERS RE-APPOINTED TO THE R C A M C —ACTIVE FORCE

JULY 1946

(Previous sections in January, March, April, May, June, July, September, October, November, and December, 1945 and January, March, May, June, July, August and September, 1946)

SECTION LXXIX

Name	Address	Date of re appointment
McCannel, J S,	Royal Jubilee Hospital, Victoria	23 6-46

MEDICAL OFFICERS APPOINTED TO THE R C A M C —ACTIVE FORCE

JULY 1946

SECTION LXXX

Name	Address	Date of appointment
Roy, D C,	1515 West 12th Ave, Vancouver	16 3-46

MEDICAL OFFICERS STRUCK OFF STRENGTH OF THE R C A M C —ACTIVE FORCE

JULY 1946

SECTION LXXXI

Name	Address	Date struck off strength	Name	Address	Date struck off strength
Attkin R R,	847 Dundas St, London, Ont	13 6-16	Drulik, S,	552 Victor St, Winnipeg	21 6-46
Anderson I R,	Campbellford Ont	15 6-16	Jarrell W A,	311 Pacific Ave Toronto	25 6-46
Ansley, H A,	236 Inglewood Drive, Toronto	25 5-16	Fearon, B W	Mulgrave NS	28 6-46
Anthony, L	1686 Mt Pleasant Rd, Toronto	27 6-16	Iloron, S A,	101 Spadina Ave, Hamilton,	
Armitage, T F H,	Vancouver	5 6-46	Ont		20 6-46
Arnup, W B,	31 Rosemount Ave, Toronto	15 6-16	Fortin, J N,	3951 Wellington St, Verdun,	
Asselstine, H S,	2105 Victoria Ave, Windsor,		P Q		3 6-46
Ont		13 6-46	Gammie, R B	Ariss Ont	19 6-46
Asselstine, J L,	27 York St, St Catharines,	18 6-16	Gauthier, R,	St Gregoire Nicolet Co, P Q	15 5-46
Ont			Gibson I D,	336 Barric St Kingston, Ont	29 5-46
Aube, R,	Hebertville Station Lac St John,		Gold, H,	1120 Cameron St, Regina	18 6-46
P Q		3 5-16	Gremer, F	Labell, P Q	11 6-16
Barelav, M J,	Trochu Alberta	3 6-46	Guthrie, D G,	812 St Roch St, Montreal	8 6-46
Bern, I W,	c/o Idehty Life Insurance Co,		Hall R L,	Wadina, Sask	5 6-46
Regina		3 6-46	Hall, W T	11022 97th Ave, Edmonton	4 6-46
Bell, R H,	RR 1, Stayner, Ont	15 6-16	Hardin, I T,	9062 10th Ave, Edmonton	21 5-46
Belleau, L P,	Laehute, P Q	11 6-46	Hardman, I G,	Revelstole, B C	6 6-46
Berjansky, C A,	Rimbey, Alberta	1 6-46	Hurshman, T P,	369 Sunnyside Ave, Toronto	22 6-46
Bernstein, P,	Coehrane, Ont	13 6-16	Hodgkiss, W R,	101 Lee Ave, Toronto	22 6-46
Bigman, C,	11 Buade St, Quebec City	11 6-16	Hurteau, J L A,	Windsor Hotel, Montreal	14 6-46
Black, H H deB,	401, 1800 McGregor St,		Hutchins, D T A,	RR 1, Selomberg, Ont	15 6-46
Montreal		21 6-46	Ingham, G H,	113 William St, Stratford,	
Blais, J A,	3397 Maplewood Ave, Apt 3,		Ont		13 6-46
Montreal		11 6-46	Jamieson, R L,	25 Shuter St, Port Hope,	
Bourque, H,	112 Bronson Ave, Ottawa	14 6-46	Ont		25 6-46
Calveit, L J,	1 Rowanwood Ave, Apt 1,		Jewell, T B,	1445 Bishop St, Montreal	11 6-46
Toronto		5 6-46	Johannesson, T,	818 Bannrug St, Winnipeg	13 6-46
Cameron, H M,	125 Park Road, Ottawa	24 5-16	Johnston, R A Y,	611 Talbot St, London,	
Cameron, W K,	70 Charles St East, Toronto	15 6-46	Ont		17 6-46
Campbell, M J C,	1230 Rue Desaulles, St		Jones, W T,	52 Kennedy Park Rd, Toronto	14 6-46
Hycynthe, P Q		10 5-16	Karn, G M,	4251 Hampton Ave, Montreal	18 6-16
Caplan, H,	4145 De Bullon St, Montreal	5 6-16	Ker, W J,	2260 Barker St, Niagara Falls,	
Conover, K I,	1225 Bishop St, Montreal	19 6-46	Ont		18 6-46
Coulson, E C,	12 Hampton Court Apts,		Kothum, J,	232 8th St, Saskatoon	11 6-46
Avenue Road, Toronto		20 6-46	Kirkpatrick, T C	New Hamburg, Ont	12 6-46
Cromwell, L W,	Queenswood Drive, Victoria	13 6-46	Labreque, M J P,	Notre Dame Hospital, 1560	
Culnan, G F,	209 Indian Road Crescent,		Sherbrooke St East, Montreal		11 6-46
Toronto		13 6-46	Lamberti, A I D,	219 Maria St, Toronto	8 6-46
Davies, L S,	197 Lonsmount Drive, Toronto	4 7-46	Line, G A,	171 Albert St East, Sault Ste	
Day, F G,	Edmonton	16 1-46	Marie, Ont		20 6-46
Delaney, R J,	31 Dunlop St, Barrie, Ont	4 7-46	Ledue, L J,	4796 Adam St Montreal	13 6-46
Desrosiers, J A B,	Lanoraie, P Q	26 6-46	Lovering, I H D,	Trafalgar, Ont	18 6-16
D'Echeverry, A,	2-Rue Academie,		McCallum, T A,	Address not known	26 1-46
Sherbrooke P Q		4 6-46	McCurdy, D G,	814 George St, Sydney, NS	14 6-46

Name	Address	Date struck off	Strength
MacFarland, M T,	21 Chaplin Crescent Toronto	22 6 46	
McKelvey, A D,	114 Rosedale Heights Drive Toronto	19 6 46	
McKenna, I E,	75 8th Street, New Toronto	15 6 46	
McKenzie, A F,	148 Westminster, Toronto	11 6 46	
McMartin, J W,	4727 Western Ave, Montreal	21 6 46	
McNeill, I I,	135 Tindall Ave, Toronto	14 6 46	
MacPherson A D,	Provincial Mental Hospital Ponoka, Alberta	22 6 46	
McQuay, I B,	183 Clergy St, Kingston, Ont	24 6 46	
Mayer, I H,	144 McPhray Ave, Winnipeg	11 6 46	
McIsaac, G F,	2 Ingleside St, London, Ont	18 6 46	
Mendelson, I,	95 Oxford St, Toronto	19 6 46	
Metivier, H P,	St Norbert Co, Arthabaska, P Q	13 6 46	
Miller, A,	128 Lamarack St, Timmins Ont	22 6 46	
Milne, K W,	Sanitorium P O, Gravenhurst, Ont	26 6 46	
Milrod S,	160 Chiltern Hill Road, Toronto	21 6 46	
Moore, I H,	Kincaid, Sask	7 6 46	
Morin, L A I,	Gravelbourg, Sask	15 5 46	
Moscovitch, B B,	4238 Pine Crescent Vancouver	1 6 46	
Murphy, D R,	5050 Roslyn Ave, Apt 31, Montreal	20 6 46	
Murphy, D K,	664 University Drive, Saskatoon	3 6 46	
Murray, I F,	402 Rushton Road, Toronto	13 6 46	
Mussels, I L,	12 Thurlow Road, Hampstead, P Q	4 6 46	
Nehol, D A,	613 Dufferin St, Saskatoon	26 6 46	
Oestreicher, D L,	Dashwood, Ont	14 6 46	
Park, A M,	2 Gleagrove Ave W Toronto	19 6 46	
Patterson, T H,	211 Dufferin Ave, Belleville, Ont	19 6 46	
Paul, G M,	Box 392, Nipawee, Ont	7 6 46	
Peat, R S,	353 Frontenac St, Kingston, Ont	24 6 46	

Name	Address	Date struck off	Strength
Piper S A	Ceylon Ont	15 6 46	
Poreheron R	12 Allen Ave Kirkland Lake Ont	17 6 46	
Porter I M,	55 Collierview Ave Toronto	8 6 46	
Postnikoff I I	Plum Tnke Sask	17 6 46	
Probert L A	1211 4th Ave Moose Jaw Sask	7 6 46	
Ramusay D W	327 Forbes St New Glasgow NS	6 6 46	
Robertson H F	83 Rosedale Heights Drive Toronto	20 6 46	
Rochette M	La Milline P Q	24 5 46	
Rogers, K F,	Westminster Hospital London Ont	15 6 46	
Rook F W	222 Glenmaror Drive, Toronto	19 6 46	
Ross, M	414 Lytton Blvd, Toronto	21 6 46	
St John, I R,	Uxbridge, Ont	15 6 46	
Shapiro, M J,	14 Boulton Drive, Toronto	15 6 46	
Shragovitch I,	6151 Durocher Ave Outremont, P Q	25 6 46	
Sloan, N,	1239 Wellington Crescent, Winnipeg	20 6 46	
Smith, G W,	41 Stillard Ave, Toronto	15 6 46	
Smith R R W,	516 Albert Ave, Saskatoon	7 6 46	
Snider, G L,	261 Concord Ave, Toronto	15 6 46	
Stein M M,	226 Niagara St, Toronto	14 6 46	
Stephens, J W,	Hanna, Alberta	3 6 46	
Strauchler, I,	Langenberg Sask	3 6 46	
Stuart, I G,	808 Bannatine Ave, Winnipeg	5 6 46	
Susman, B R	Kingston, Ont	24 6 46	
Susman, G W,	3445 Peel St, Montreal	20 6 46	
Vietor, M B,	7 Ontario St South, St Catharines Ont	13 6 46	
Walker, N L,	Ontario Hospital, Orillia, Ont	22 6 46	
Walls, H M,	70 Fellingbrook Road, Toronto	19 6 46	
Warren, R I,	Falkland, Via Kamloops, BC	18 6 46	
Werner, M A,	55 Brant St Burlington Ont	13 6 46	
Whiting, M L,	252 Castlefield Ave, Toronto	18 6 46	
Wilson, K E G,	185 Metcalfe St, Ottawa	11 6 46	
Wolchoff, M,	10238 114th Street, Edmonton	4 6 46	
Zeldin, A,	490 Euclid Ave, Toronto	12 6 46	

SPECIAL CORRESPONDENCE

The London Letter

(From our own correspondent)

REFORM OF THE GENERAL MEDICAL COUNCIL

A recent case in which a doctor, struck off the Register by the General Medical Council because of alleged infamous conduct, was subsequently reinstated as a result of his complete vindication in a civil action following his erasure, has brought to a head the problem of reform of the Council. Created in 1858, there has been little change in the constitution of the Council since its rules were revised in 1886, and there is a general consensus that a complete review of the functions and the rules of the Council is now required. Its threefold function under present conditions, to control the Medical Register, to control standards of medical education and to exercise disciplinary action on the profession, imposes a strain upon its unwieldy constitution that militates against its efficiency.

It is in the exercise of its disciplinary powers that reform is most urgently required. At the moment the Council labours under the great handicap of having no powers to administer an oath to a witness, in addition it may decline to receive evidence from a witness who declines to be cross examined, or who is not present. Another curious anomaly is that a medical practitioner has no right of appeal from the Council to a Court of Law. Yet another anomaly that will arise once the National Health Bill becomes law is that there will then be two tribunals dealing with

doctors, the Council and the tribunals to be set up under the terms of the Bill.

The problem is not an easy one, but it should not prove insoluble. The Medical Defence Societies have already published a memorandum indicating the lines along which reform could be initiated.

THE NUFFIELD FOUNDATION

The first report of the Nuffield Foundation covering the three years ending March, 1946, is a magnificent tribute, not only to the generosity of the founder, but also to the skill with which the trustees have carried out their allotted task. It was in 1943 that Lord Nuffield established the Foundation as a charitable trust and endowed it with ordinary stock units in Morris Motors Ltd, to the value of £10,000,000.

The three main objects of the Foundation are "the advancement of health and the prevention and relief of sickness", "the advancement of social well being" and "the care and comfort of the aged poor". In the medical field attention has been directed mainly to child health, industrial health and dental health, and working through the universities the Foundation, by means of liberal grants, has been responsible for a rapid advance in the plans for dealing with these major problems of modern medicine. In the field of social science and the care of the aged poor much preparatory work has had to be carried out in exploring the necessary lines of action in these comparatively unexplored fields of research, but much good progress has been made. There can be little doubt that before long the community will begin to reap the benefits of this carefully controlled preliminary investigation.

FAMILY ALLOWANCES

August 6 will long remain a historic day in the annals of social progress in this country, as it was on this day that the first payment of family allowances was made under the Family Allowances Act. Under the terms of this Act every child in the country, except the first born in each family, is entitled to a weekly allowance of five shillings. This is a step in the right direction, but it is no more than a step. As a means of relieving childhood poverty it is long overdue, but it brings into sharp focus the problem facing the professional worker today. For the professional worker with a family of several children, a grant of 5s per week (less 2s 6d income tax) for each child except the eldest, does not go far towards meeting the heavy educational expenses that he has to face if he wishes to give his children a first class education. As *The Times* puts it in an editorial, "one reform which needs to be considered is the use of the income tax and family allowance system not merely as a means of levelling up or levelling down all families nearer to a happy mean, but also, at each income level, as a means of securing that the family with several children is not substantially worse off, when account is taken of its size, than the family with fewer children."

SOCIAL RELATIONS IN INDUSTRY

A sign of the times is the setting up of the Tavistock Institute of Human Relations, which has just been announced. Housed in the same building as the well known Tavistock Clinic in London, the Institute has set out to do the fundamental research needed for a better understanding of social problems in industry. Among its first studies are to be the problem of the conditions that lead to good morale in the working group, and the qualities required for leadership in industry. While research is the primary aim of the Institute, it is hoped that in time the members of the Institute will be able to advise industry on the best methods of removing friction and ineffectiveness. A possible danger in this practical application of its studies is that the Institute may come to be looked upon as an agent of the employers interested only in securing increased production, but this danger has been foreseen and should be avoided without too much difficulty. In the initial stages the Institute has been financed by grants from the Rockefeller Foundation and from other donors in this country.

THE SPASTIC CHILD

Yet another step has been taken in bringing relief to the crippled child by the launching of a scheme for the establishment of a school for children with cerebral palsy, to be known as the St Margaret's School for Cerebral Palsy. It is estimated that there are 5,000 children in this country suffering from this form of paralysis, and hitherto there has been practically no special training available for them. The new school is to open in October with some 40 children, and in the first instance it is proposed to concentrate on cases which show a good prospect for improvement. In addition to actual treatment, attention is to be devoted to research and to the training of workers who will be available in similar schools in provincial centres. The two physiotherapists of the school have trained at Dr Phelps's clinic for cerebral palsy in Baltimore, and the education psychologist has studied the work in American clinics.

WILLIAM A R THOMSON

London, September, 1946

CORRESPONDENCE

The Greek War Relief Fund

The following letter has been received by the General Secretary

Further to our appeal for surgical instruments and hospital supplies, and your letter of January 29 advising that a notice would be published in the *Bulletin*, we wish to advise you that we have received donations of surgical instruments from the following: Dr Alexander King, New Westminster, B.C., Dr Ross Mitchell, Winnipeg, Man., Kootenay Lake General Hospital, Nelson, B.C., Mrs C A Planche, West Vancouver, B.C., British Columbia Medical Association, Vancouver, B.C.

Letters of appreciation have been forwarded in each case. The supplies donated to us by the Royal Victoria Hospital are now in Greece.

Although we are not familiar with the use of most surgical instruments, we realize that we have received donations which will be of much assistance in Greece and we wish to thank you for your intercession in our behalf.

B C SALAMIS,
National Secretary

Montreal,
July 26, 1946

ABSTRACTS FROM CURRENT LITERATURE

Medicine

Thiouracil Effect in Diabetes Mellitus Complicated by Hyperthyroidism. Raveno, W S. *Am J Med Sc*, 211: 174, 1946

Control of diabetes complicated by hyperthyroidism is a difficult problem. Six patients presenting this condition were treated with thiouracil. 3 showed improved control of diabetes following remission in the hyperthyroidism induced by thiouracil. A fourth showed improvement but the remission in the thyrotoxicosis had been previously induced by iodine and not by thiouracil. The remaining 2 patients failed to respond to the treatment.

The 4 patients who improved all had secondary hyperthyroidism, (toxic adenoma) which became manifest after the diabetes appeared. The two failures had primary hyperthyroidism (toxic diffuse goitre) which antedated their diabetes.

Of 13 patients reported in the literature, 4 responded favourably while 9 failed to show improved control of the diabetes. With the 6 patients reported here the total is 19, of which 8 were improved (one of these with iodine), and 11 not improved.

Apparently thiouracil is comparable in effectiveness to thyroidectomy where the hyperthyroidism is secondary. In primary hyperthyroidism, or exophthalmic goitre, while it does control the toxicity, it exerts little favourable influence on the control of the associated diabetes.

LILIAN A CHASE

Pneumonia in the Aged. Zeman, F D and Wallach, K. *Arch Int Med*, 77: 678, 1946

Reference is made to the fact that pneumonia is no longer the menace to the aged described by Osler in his phrase "the old man's friend". This is due partly to the new drugs and other measures such as inhalation of oxygen. One of the problems in this age group is the difficulty of accurate diagnosis because of atypical features and associated diseases.

The authors have made use of information obtained from the study of 166 cases of pneumonia in patients

over 60 years. Drugs of the sulfonamide group and penicillin were both used in the treatment. As usual, the mortality rate was lower in women. The bacteriology was similar to that found in other age groups with this disease, specific organisms, filterable viruses accounting for their usual share, leaving a large percentage to "pneumonia of undetermined origin".

The effect of associated conditions such as cardiovascular disease, poor nutrition, is discussed and the extra hazard caused by the presence of diabetes, and the conclusion reached that these cases can be successfully treated in spite of the presence of such other diseases, and that many apparently hopeless cases can be made well again.

Among the factors that make diagnosis difficult are the tendency of the aged to be often very late in seeking medical aid, the symptoms being referred to the abdomen, or resembling those of a cerebral accident—even a hemiplegia, due either to a toxæmia or temporary disturbance of the cerebral circulation. Reference is made to the latency of the disease, where a definite consolidation of a lobe can be present with no symptoms and what appears to be sudden death occurs in one who was not known to be ill.

Disease of the respiratory tract accounts for over 20% of all sudden deaths. Again, pneumonia in the aged may run in a febrile course, and may be of the relapsing and recurring form which may go on for months, new sections of the lung being involved as the parts affected are healing. In view of all these unusual aspects, the x-ray is the most valuable aid to diagnosis but all the laboratory assistance that is available must be used and the many kinds of pneumonia kept in mind. A casual conclusion based on fever and a few rules at a base is a feeble attempt.

The authors feel that it is quite safe to allow an aged patient to remain quietly in bed with enough movement of the legs to prevent thrombosis, as long as breathing or movement is not restricted by a cast or strapping. Great emphasis is placed on the details of treatment, control of fluids, use of oxygen, etc.

P. M. MACDONNELL

Spontaneous Mediastinal Emphysema Fagin, I D and Schwab, E H *Ann Int Med*, 24 1052 1946

The data of 36 reported cases and 3 contributed by the authors are analyzed. This condition commonly arises in otherwise healthy young men under normal conditions, such as during or after moderate exercise. Sudden sharp pain is characteristic, often beginning in the lateral chest and shifting to the precordium. It commonly radiates to the left shoulder and down the left arm, simulating angina. Anxiety and profuse perspiration are common accompaniments at the outset. Dyspnea may occur, particularly with an associated pneumothorax, but is usually mild and without cyanosis or orthopnea. Mediastinal crepitation (Hamman's sign) is striking, and may go with decreased cardiac dullness. Twenty-one of the 36 cases from the literature showed left-sided pneumothorax, whose occurrence releases the tension in the mediastinum and inhibits further air leakage from the alveoli of the collapsed lung. Subcutaneous emphysema follows extension from the mediastinum and similarly reduces tension there. Any disease entity having pain in the chest may be confused with it, such as myocardial infarction or insufficiency, acute pericarditis, dissecting aortic aneurysm, pleurisy, pulmonary embolism and intercostal neuritis. Diagnostic pointers are (1) the usual absence of shock, fever, tachycardia, hypotension, leucocytosis, acceleration of the sedimentation rate or significant changes other than low voltage or

the electrical axis, (2) the presence of mediastinal crepitation, diminished cardiac dullness, subcutaneous emphysema, pneumothorax and roentgenographic evidence of mediastinal air, and (3) its preference for young adults. The prognosis is usually favourable, with recovery in a few days or weeks. It may recur. Reassurance is the most beneficial treatment. Analgesics

at the outset may be necessary. In emergencies air may be withdrawn from the mediastinum. The presentation adds to our knowledge of a condition which has been intensively studied in recent years.

C. C. MACKLIN

Carcinoma of the Rectum in Sisters Rewell, R F *Brit M J*, 1 687, 1946

One sister aged 23, the other 32, had carcinoma of the rectum with metastases. One had polyposis, the other multiple telangiectasia of the rectal mucosa. The father had been killed in World War I, the mother and 3 half-sibs had no rectal symptoms. Inheritance of polyposis usually follows the dominant mode of transmission, the inheritance was presumably through the father.

MADGE THURLOW MACKLIN

Cryptorchidism in Three Brothers Brimblecombe, S L *Brit M J*, 1 526, 1946

Three brothers, aged 10, 7, and 5, the only children in the family, had undescended testes. There was no sign of them in the inguinal canal, and intrauterine S given to the oldest boy was of no avail in causing any descent. The treatment was not started until he was 10 at which time the condition was discovered by the author practically simultaneously in the three brothers.

MADGE THURLOW MACKLIN

The Clinical Signs of Meningeal Irritation O'Connell, J E A *Brain*, 69 9, 1946

The signs of meningeal irritation are described and discussed. Various explanations that have been offered in the past for them are reviewed. They include cervical rigidity, head retraction, Kernig's sign (limitation and painful flexion of the hip and extension of the knee), Brudzinski's sign (flexion of the lower limbs when the neck is flexed), Brudzinski's leg sign (flexion of one leg at the hip and extension at the knee causing a simultaneous flexion of the opposite hip and knee), and finally opisthotonus.

Studies were made on the effect of flexion of the head and neck and legs on the relationship of the spinal cord to the vertebrae. This was done on cadavers in which widespread laminectomies had been performed. He found that when the head was fully flexed on the trunk a cephalad movement of the dura and spinal cord occurred. The tension of the intradural nerve roots increased. With extension of the head a caudad movement of the dura and spinal cord took place and the tension on the intradural nerve roots diminished.

Flexion of a leg at the hip and extension at the knee (Kernig's sign) caused tension on the extradural nerve roots entering the sciatic nerve, associated with a caudad movement of the dura and conus. The posture giving maximum relaxation of intraspinal nerves is one of intermediate degrees of flexion of both hips and knees. The author feels that it is a justifiable assumption that spinal nerve roots as they traverse the inflamed meninges will be hypersensitive to mechanical stimulation by compressing or stretching. He believes that the majority of signs of meningitis are due to reflex muscular hypotonia designed to protect the spinal nerve roots from painful tension stimuli. The signs can be grouped under three headings: (1) those which provide maximum relaxation, (2) muscle spasm resisting movements that produce painful tension in the nerve roots, and (3) reflex movements designed to relax inflamed nerve roots when they have been rendered tense by some test manoeuvre. When one considers the arguments put forward by the author one feels that he has a logical basis for the signs of meningeal irritation.

PRESTON ROBB

Myasthenia Gravis Viets, H R *J Am Med Ass*, 127 1089, 1945

In the past eight years there has been considerable advance in our knowledge of myasthenia gravis. With the discovery of the therapeutic effect of prostigmine

(neostigmine) by Walker, and the beneficial effect of removal of the thymus in some cases as shown by Blalock, great interest in the study of this disease has developed. In spite of the important contributions that have been made, a complete conception of the cause of myasthenia still eludes us, and many of the clinical features of the disease are not understood. In this paper the author reports on the experience gained in treating 125 cases at the Massachusetts General Hospital, and reviews the literature.

In making the diagnosis the prostigmine test is most useful. Neostigmine methylsulphate, 15 mgm, with atropine sulphate, 0.6 mgm, is given subcutaneously. In a case of true myasthenia there is a rapid removal of the weakness of the voluntary muscles, with return of the ability to move the eyes and the facial muscles and normal resumption of the functions of chewing, talking and swallowing. The use of the fluoroscope to study the swallowing reflex before and after neostigmine is one of the most important of the manoeuvres used in the diagnosis.

It is known that the condition is due to a disturbance at the myoneural junction, and that the neostigmine inhibits the action of cholinesterase, thus allowing acetylcholine to remain at the myoneural junction. Treatment is aimed at giving enough neostigmine to maintain the patient throughout the twenty-four hour period. With each patient the dosage varies a great deal. Their average was 10.9 tablets of 15 mgm of prostigmine bromide orally over 24 hours. The highest was 25 a day. In cases of emergency the patient is provided with an ampoule of neostigmine methylsulphate for intramuscular or subcutaneous injection, along with a letter of instruction. Ephedrine sulphate can also be used. Its effectiveness is about 10 to 15% of that of neostigmine. Usually 24 mgm is added two to three times a day.

Following the work of Blalock 15 patients were subjected to thymectomy. There were four operative deaths, or 26%. Thymomas were found in four patients, hyperplasia of the thymus in three, and in eight patients the thymus appeared normal although persistent. As to results, two were considered to be in complete remission, two were considered to be distinctly improved, three moderately improved, one slightly improved, and three had been operated on too recently to evaluate. The author points out the difference in evaluating the results of thymectomy, as many patients often have spontaneous remissions. In view of this and the high mortality, he did not feel that thymectomy should be recommended in every case.

J P ROBB

The Dick Test in Military Personnel Rantz, L. A., Boisvert, P. J. and Spink, W. W. *New Eng J Med* 235 39, 1946

While a positive Dick test is useful in indicating individual susceptibility to scarlet fever, (susceptibility to the scarlatinogenic strain of hemolytic streptococci), a negative reaction does not indicate immunity to hemolytic streptococcal infection.

Of 1,280 white men admitted to a large military hospital with acute respiratory illness 27.8% had a positive Dick reaction. Positive tests were less frequent over the age of twenty, in those who had had more than twelve months military experience and among men whose premilitary residence had been in areas known to have a low incidence of hemolytic streptococcal disease.

Exposure to the hemolytic streptococcus is considered essential for the establishment of a positive Dick reaction, which is probably the result of an acquired hypersensitivity to the products of the streptococcus rather than an indication of a natural susceptibility to a true toxin.

NORMAN S SKINNER

Generalized Dermatitis from Pediculosis Capitis Ronchese, F. *New Eng J Med*, 234 665, 1946

Generalized dermatitis may result from pediculosis capitis, presumably upon a neurogenic basis. The patient is usually of school age, or slightly older. While

this type of dermatitis is not common the cause is frequently not recognized and the condition will persist until delousing of the scalp is complete.

NORMAN S SKINNER

Surgery

The Technique of the Syme Amputation Alldredge, R. H. and Thompson, T. C. *J Bone & Joint Surg*, 28 415, 1946

The advantages of the Syme amputation in a series of 75 cases are described in detail. The follow-up extends over three years. The operation itself is described in detail. The pre-operative selection of cases is considered important. Cases which have had ligation of major vessels or those showing marked visomotor spasm have lumbar sympathectomy or novocaine block done prior to the operation.

In the postoperative treatment the dressings are left in until the discharge ceases, as long as seven days in some cases. As soon as the wound has healed, a walking pylon is applied. This is generally between the third and fourth week. Weight bearing without support begins at the fifth week. None of these patients have had phantom limbs or causalgia. In seven of the cases minor complications, such as sloughing of a part of a heel flap, has occurred, but in no case has re-impairment at a higher level been necessary.

G. H. FISK

Conservation of Short Amputation Stumps by Tendon Section Blair, H. C. and Morris, H. D. *J Bone & Joint Surg*, 28 127, 1946

The authors have demonstrated on 32 short stumps the value and effectiveness of section of the biceps tendon in short elbow stumps and section of the gracilis, semimembranosus and semitendinosus tendons and biceps femoris tendons in short leg stumps. In these short leg stumps the fibula is excised at the same time. In no case was it necessary to section the sartorius. In every case satisfactory prostheses have been fitted.

G. H. FISK

Total Pancrectomy for Carcinoma of the Pancreas in a Diabetic Person Dixon, C. F. et al. *Arch Surg*, 52 619, 1946

The authors present a case history in which total pancreatectomy was performed for carcinoma of the pancreas developing in a diabetic person. This patient was alive and well twelve months after operation. The authors remark that only one similar instance is known to them and this patient was living and well eighteen months after operation.

Dixon's patient was a man, fifty years of age, with a large tumour of the head and body of the pancreas which proved to be an ulcerative mucous adenocarcinoma grade 2. At operation to and exposure and to lessen bleeding, the spleen was removed. The pancreas, duodenum and distal third of the stomach were also removed. The duodenal stump was inverted and an anterior gastrojejunostomy (end to side) was performed. The postoperative course was uneventful. The authors present data on the formation of ketone bodies during insulin privation, on the loss of foodstuffs in the stool and on hepatic function, as a contribution to our knowledge of deproteinized man. They conclude that a deproteinized adult requires about 20 to 70 units of insulin daily during the first week or so after operation and about 25 to 40 units daily for the maintenance thereafter.

The changes in the blood and urine during the periods of insulin privation of 80 hours each in the case of this diabetic man, who underwent total pancreatectomy because of an adenocarcinoma grade 2, were as follows: when 140 gm of carbohydrates were given the ketonuria was slight and when 125 gm were given the ketonuria was pronounced. The total removal of the pancreas was followed by considerable reduction in the digestion and absorption of fat. Concentrated pincetatin in enteric coated tablets (15 gm daily) was

found to reduce the loss of fat and protein by up proximately 50%. The patient's diabetes during the period of eight months following the operation remained about the same severity the protamine zinc insulin requirements being approximately 40 units a day. Hepatic function remained unimpaired. His health remained good. G E LEARMONTH

Foreign Bodies in and in Relation to the Thoracic Blood Vessels and Heart Harken D E and Williams A C *Am J Surg*, 72 80, 1946

Three cases in which migratory foreign bodies were successfully removed from intrathoracic blood vessels are reported. In one patient, palpation of a machine gun bullet in the left pulmonary artery at thoracotomy resulted in its being dislodged and moving into the pulmonary trunk, then into the right pulmonary artery from which it was ingeniously removed at a second operation. In another case, a shell fragment which had entered the pulmonary vein or left heart was removed from its resting place in the innominate artery where it had caused circulatory disturbances in the right arm. In the third patient, a bullet had entered the inferior vena cava and was removed from the left pulmonary artery.

The 11 cases found in the medical literature up to 1942 are discussed. Most of these had ended fatally, and this prompts the authors to recommend that a careful search be continued till the foreign body is located in all penetrating wounds. If such a patient develops unexplained symptoms, fluoroscope and x-ray should be used to ascertain whether a migratory missile is responsible.

Removal of intravascular foreign bodies is advocated (1) to avoid hazards of vascular occlusion, (2) to diminish the dangers of sepsis, (3) to prevent erosion and hemorrhage, (4) to remove possibility of embolism. BURNS PLEWES

Primary Suture of Nerves Zachary, R B and Holmes, W *Surg, Gyn & Obst*, 82 632, 1946

Primary nerve suture is defined as the repair of the nerve through the unhealed wound at the time of the operative treatment of the wound itself. The results of primary and secondary sutures done at the peripheral nerve injury Centre at Oxford are reviewed in detail both clinically and histologically.

The clinical recovery of sensory and motor power was better in the case of early secondary nerve suture as compared with those with primary suture in the ulnar nerve both above and below the elbow, median nerve, and was striking in the 13 cases of radial nerve repair. Sensory and popliteal nerve recoveries were poor when over the suture was done. Recovery after nerve suture was excellent in the case of young children. No evidence was found that galvanism postoperatively influenced the quality of recovery.

Histological study of specimens of nerves sutured at primary nerve suture did not approach nearer to perfection than the best results of early secondary suture. The difference in favour of secondary suture is not wholly explained by infection after primary suture. The chief factor is the difficulty in recognizing how much of the nerve has been damaged on each side of the division so that resection is often inadequate at the primary operation. Tension is often too great because extension mobilization of the nerve is not done in a fresh wound. After 3 or 4 weeks the extent of nerve injured can be seen and felt and the sheath is thicker and easier to suture accurately. Primary approximation of the divided nerve ends is always advisable. BURNS PLEWES

L'anus temporaire angulo colique droit dans la chirurgie colo-rectale Bergeret et Champenu *Presse Med*, 24 335, 1946

L'anus angulo colique droit n'est indiqué que comme premier temps de la chirurgie d'exérèse du colon gauche, du rectum de l'angle colique gauche ou même de la

partie gauche du transverse. Consiste jusqu'à la castration complète de l'isthme, il se présente sous forme d'intervention en elle-même est très simple et comporte moins de difficultés d'exteriorisation et de nettoyage du colon qu'on ne le croit communément.

Par contre, les avantages en sont considérables dont le principal est la liberté de manœuvre qui lui permet facilitant particulièrement le décollement colopariétal du colon gauche et de l'angle colique gauche lorsque le colon sigmoïde est court. Les auteurs donnent quelques précisions sur la fixation de l'anus angulo colique droit et la manière de nettoyer le segment provisoirement exclu. Lorsque le cancer se révèle à l'exploration inextirpable il est toujours facile, dans la même séance opératoire de fermer l'anus droit et d'établir un anus gauche définitif. PIERRE SMITH

Obstetrics and Gynaecology

Amenorrhœa at Stanley Camp, Hong Kong, During Internment Sydenham, A *Brit M J*, 2 159, 1946

In Stanley internment camp, Hong Kong, from January, 1942, to September, 1945, 53.67% of the women between the ages of 15 and 45 suffered from amenorrhœa of more than three months' duration.

A few women presenting symptoms of discomfort were treated with the available drugs, namely, thyroid extract and menformin injections.

Within six months 81 women had started menstruating again, and within 18 months menstruation was re-established in all except six cases, which persisted throughout the period of internment.

Possible cause of amenorrhœa are discussed under the headings of (a) emotional shock, and (b) undernourishment with special reference to protein deficiency.

ROSS MITCHELL

Weight Control, Diet and Fluid Balance in Pregnancy Loughran, C H *Am J Obst & Gyn*, 52 42, 1946

Three hundred and twenty-five cases are presented in which a regimen was prescribed to permit only a slight gain in weight, 15 lbs, as the top weight gain for the average woman, but the larger the woman the less the gain allowed. The regimen consists of a high protein low carbohydrate diet with added vitamins. Salt is not restricted in the early months, but later is permitted only in the preparation of food. If there is a sudden weight gain, the fluid balance is checked. The fluid intake is then restricted to the previous day's output. Salt is withdrawn and if fluid balance is not obtained, magnesium sulphate is to be taken each morning to produce free fluid evacuation. Exercise was freely carried out. With this regimen the length of labour was markedly decreased, the incidence of dystocia markedly lessened, and any real toxic state totally absent, except in one case of chronic nephritis which is not influenced by this type of regimen. Three severe cases of hypertensive cardiovascular disease were decidedly improved and were uneventfully delivered.

ROSS MITCHELL

Neurology and Psychiatry

Arteriographic Visualization of Cerebrovascular Lesions Govons, S R and Grant, T C *Arch Neurol Psychiat*, 55 600, 1946

It has been shown that cerebral angiography is a useful technique for the localization of certain vascular lesions, namely intracranial aneurysms, angiomatic malformations, occlusion of the internal carotid artery and traumatic arteriovenous aneurysms. The procedure outlined by Moniz was used by the present authors. A colloidal suspension of thorium dioxide was used as a contrast medium. A normal cerebral arteriogram is well described and illustrated.

Four cases of intracranial aneurysm were presented in which successful arteriograms confirmed and localized the lesion. Intracranial aneurysms are frequently mani-

festated by a subarachnoid hemorrhage, with sudden onset of severe headache, stiffness of the neck, with or without loss of consciousness. Frequently there is paralysis of the external ocular movements, especially the muscles supplied by the third nerve. Hyperesthesia in the distribution of the ophthalmic division of the fifth nerve with some diminution of sensitivity of the corneal reflex may be present. Other neighboring nerves may be involved. When the hemorrhage extends into the cerebral hemisphere contralateral hemiparesis with or without sensory loss or aphasia occurs. Papilloedema is rare. Visual or retinal hemorrhages may occur.

Three cases of angiomatous lesion of the brain are presented in which arteriography was of value. A uniform lateral sensitive carotid sinus reflex may suggest this condition. A case of arteriovenous aneurysm is also presented. The most frequent symptoms in this condition are bruit, headache, unilateral pulsation exophthalmos, with diplopia, chemosis, and visual disturbance.

The authors feel that in all cases of spontaneous subarachnoid hemorrhage the use of this technique should seriously be considered. J P ROBB

Three cases of occlusion of the internal carotid are presented in which arteriography was of value. A unilateral sensitive carotid sinus reflex may suggest this condition. A case of arteriovenous aneurysm is also presented. The most frequent symptoms in this condition are bruit, headache, unilateral pulsation exophthalmos, with diplopia, chemosis, and visual disturbance.

The authors feel that in all cases of spontaneous subarachnoid hemorrhage the use of this technique should seriously be considered. J P ROBB

Amphetamine (Benzedrine) Sulphate for Acute Barbiturate Poisoning Freireich, A W and Landsberg, J W *J Am M Ass*, 131 661, 1946

In recent years one of the mainstays in the treatment of barbiturate poisoning has been picrotoxin. The present status of therapy with picrotoxin can be summed up in the report of the Council of Pharmacy and Chemistry. "The details of events in the course of animal experiments show that it is necessary to poison the animal with picrotoxin in order to elicit the antagonism. What results when the two drugs are given together is not a direct reversal of the depressed state but a combined form of poisoning by picrotoxin and the barbiturate with a mixture of depression and stimulation from which within a given range of doses the animal ultimately recovers. Myerson first suggested that amphetamine sulphate was a useful drug in counteracting poisoning by the barbiturates. In numerous control studies he and his associates demonstrated the reciprocal pharmacologic action of amphetamine and the barbiturates. In the present study 14 cases of barbiturate poisoning were treated with intravenous amphetamine. A solution of 10 mgm in 1 cc of isotonic sodium chloride was used. They found that large doses could be given and their routine was 40 mgm at once and then 20 mgm every half hour. Supportive treatment of intravenous fluids was used in some cases when dehydration was present. Of the 14 cases only one died. This they felt was because the supply of amphetamine was exhausted and they were only able to give 360 mgm. The results were good, however they do not prove clinically that the drug is actually better than picrotoxin. No mention is made of gastric lavage, diuresis or the importance of intravenous fluid in the care of patients with barbiturate poisoning. J P ROBB

Experimental Evidence on the Cerebral Origin of Muscular Spasticity in Acute Poliomyelitis Bodian, D *Proc Soc Exp Biol & Med*, 61 170, 1946

One of the common symptoms of acute poliomyelitis in man and in experimental primates is the muscular rigidity, associated with hyperreflexia which often precedes flaccid paralysis. Recent observations concerning muscle spasticity are in agreement with respect to the following points: (1) muscle spasticity in acute poliomyelitis is a reflex phenomenon associated with increased stretch reflexes, (2) spasticity in acute poly-

myelitis has a widespread occurrence in the skeletal musculature, may be present in both flexors and extensors, and may occur in partly weakened muscles as well as in muscles of normal strength. The observations of the author and his coworker, Dr H A. Howe, in the rhesus monkey were in agreement with these findings in human subjects. In some monkeys preparalytic spasticity was so severe that awkwardness of gait and posture was apparent, and the resistance of the extremities to passive movement was "claspknife" in character.

It has been commonly assumed that the lesion that has been responsible for the spasticity has been in the region of the spinal cord which supplies the local reflex mechanism. The author, working with monkeys, inoculated the animals with Lansing virus and killed them in the preparalytic period after definite spasticity had become manifest. Then pathological studies were made of the brain and spinal cord to determine what parts had been affected by the virus. The findings indicated that neither virus activity nor lesions in the spinal cord were necessary pathogenic factors in the production of spasticity in acute poliomyelitis. The marked spasticity seen in the legs of the monkeys described, in the absence of pathological changes in the lumbosacral cord, must be attributed to the pathological changes present in the brain or cervical region of the spinal cord. Severe damage in the brain in primate poliomyelitis including the greatest amount of nerve cell destruction most often occurred in the vestibular centres. The findings suggest that it is the severe lesions in the reticular formation which may be at least, in part, responsible for the generalized spasticity, because of destruction of many "inhibitory" neurons. It was also of interest that all of the animals had fully developed pathological changes in the brain before limb paralysis was manifested. It was concluded that lesions in the brain alone can produce the spasticity of acute poliomyelitis. J P ROBB

The Motor Cortex in Amyotonia Congenita Freeman, W *J Neuropath & Exper Neurol*, 5 207, 1946

This paper is based on the study of six cases, four of whom provided material for complete pathological study. There was no doubt that they were dealing with a congenital disorder since the children were marked from the moment of birth by flabby muscles and a weak cry. This disease may persist for many years with slight improvement, although most sufferers die before the age of eighteen months. It appears to be a disorder in which there is a defective development of the whole motor system from the precentral gyrus to the muscles. In four cases the precentral gyrus was characterized by almost complete absence of large multipolar cells of Betz. The author feels that this may be an important point in differentiating the disease from infantile spinal muscular atrophy. J P ROBB

Observations in a Case of Muscular Dystrophy, with Reference to Diagnostic Significance Bowden, R E M and Gutmann, E *Arch Neurol & Psychiat*, 56 1, 1946

Diseases causing atrophy of muscle frequently present difficulties in diagnosis. For example, there are striking similarities in the course, signs and symptoms of the late dystrophy of the distal type (Gowers) and of progressive muscular atrophy. In the progressive muscular dystrophy the pathological process is thought to begin in the muscle fibres themselves, and the motor nerve remains normal. In the secondary myopathies the basic lesion lies within the spinal cord or the peripheral nerve, and the atrophy of muscle is dependent on changes in the lower motor neurons. Some authors have denied the possibility of distinguishing the two lesions histologically. Others have said that there are characteristic changes.

A case of progressive muscular dystrophy is described. The histological findings in the muscle are compared with those found in progressive muscular atrophy. In

the former the early changes consist of a reaction of the nuclei and the granular constituents of the sarcoplasm. In later stages there is complete differentiation of the striated material leading to fragmentation of the muscle fibres, accompanied by a breakdown of the chromatin of the nuclei. The late changes in dystrophic muscle fibres are identical with those seen in denervation atrophy.

In the case of progressive muscular dystrophy the nerve fibres in the nerve trunks remain intact, but degeneration of muscle fibres apparently leads to loss of contact at the myoneurial junction, and this is followed by abortive regeneration of the terminal nerve fibres. Thus one sees advanced atrophy of the muscle fibres, and intact nerve fibres.

In the secondary myopathies, such as progressive muscular atrophy the nerve trunks are empty or contain but normal fibres and empty Schwann tubes. They may however occasionally contain regenerated nerve fibres. It is felt that in cases in which the diagnosis is uncertain biopsy of muscle will afford valuable aid.

J P ROBB

Shock Therapy of Psychoses, Evidence for and Against Damage Lewis, N D C Bull New York Acad Med, 21 673, 1945

In this article the author attempts to present the subject as fairly as possible from several different viewpoints, for which he is well qualified. Before starting he points out the lack of uniformity of diagnosis in mental conditions, the unpredictable course with or without treatment, and the lack of scientific controls.

Insulin shock therapy is indicated in catatonia, paranoid, hebephrenic, and simple forms of schizophrenia (given in the order of favourable prognosis). The shorter the duration of the illness the more favourable the prognosis. Those patients who have made a fairly satisfactory life adjustment up to the age of twenty five and whose disorder is an acute episode, have the best remission rates. Patients under the age of sixteen show a low remission rate. Insulin therapy increases very definitely the percentage of remissions, and although many relapses occur, the patients have a period of better mental health which may allow them to reside outside of a mental hospital. Moreover it shortens the illness in many of those who might eventually recover spontaneously. The mortality due to therapy is less than 1%.

Subcutaneous doses of insulin provide an effective method of sedation. Its specific action seems to be in the alleviation of anxiety. With the relief of anxiety, the psychotic manifestations sometimes rapidly disappear. The method is safe and felt by Rennie to be far superior to that achieved by chemical sedation. The author warns against the use of insulin shock therapy by inexperienced hands. The most serious complication is that of prolonged coma.

The indications for the application of convulsive therapy (metrazol or electro shock) are involutional states, manic depressive psychoses, and other depressive reactions. Convulsive therapy has also been used rather freely and successfully in acute catatonic episodes. The most frequently seen complications are subconjunctival hemorrhages, aspiration pneumonia, pulmonary abscess, auricular fibrillation, cardiac dilatation, vasomotor collapse, fractures and dislocations of the bony framework, status epilepticus, and memory disturbances.

The memory loss with electro shock is greater and more prolonged than with metrazol, but electro shock is easier to administer, less time consuming, and the convulsions are less severe. With metrazol the danger of fractures is greater. The memory and fear of the treatment with metrazol is disturbing to most patients, the "missed" convulsions creating a great deal of anxiety. With the electro shock method there are no "missed" convulsions, usually no memory of the treatment and much less anxiety. In the electro shock treatment success depends on a successful convulsion. Eight to twenty treatments usually suffice for depressions except for the paranoid involutional types which may have to be given

some additional ones. Memory may give up or wane with some voracious insomnia, a slight increase in convulsions per day, instead of the usual one to three per week. Complications can be reduced by the use of curare and the proper positioning of the body.

Schulder made the point that the patient in a not really reached by shock treatment. In view of the author's experience he would support this without a doubt. The matrix of the psychosis is not changed but only the secondary presenting feature. After the most distressing symptoms are removed or modified favourably, the compensatory resources of the patient may aid him in reconstruction. Electroencephalographic changes occur during the course of treatment (electro shock), and correlate with amnesia and other evidence of impaired mental function. Where there is no evidence of impaired mental function, and no electroencephalographic alterations clinical improvement does not occur.

Taking everything into consideration he feels there is a definite place for shock therapy in psychiatry. The greatest advantage of the insulin method seems to be in its effect on schizophrenia while the convulsive therapy methods are found to be the applications of choice in the affective conditions in whatever setting they have developed.

J P ROBB

The Hypothalamic Regulation of Sleep in Rats, An Experimental Study Nauta, W J H J Neurophysiol, 9 285, 1946

This work comes from the Department of Anatomy, University of Utrecht, Holland, and presents very well our present knowledge of the function of the hypothalamus in regulating sleep along with considerable amount of experimental material. The existence of a centre for the regulation of sleep has generally been accepted. This however has given rise to a number of problems concerned, in the first place with the make up of the centre, and secondly with its mode of action. Is there a single centre for the regulation of the sleep and waking rhythm or must it be thought of as composed of two antagonistic parts?

After reviewing the work of others and the experimental work presented, it is concluded that there is a structure in the caudal part of the hypothalamus and adjacent part of the midbrain tegmentum, lesions of which cause disturbance in the waking mechanism. This structure is of specific importance for the capacity of maintaining the waking state during the absence of external stimuli. It is also felt that in the preoptic region of the hypothalamus there is a structure subserving the function of sleep. For the sake of brevity these structures are referred to as the "waking centre", and the "sleep centre" respectively. The possibility that the regulation of sleep is only one of multiple functions of a single nervous apparatus cannot be excluded, since there seems to exist a topographical identity between the hypothalamic regions involved in the regulation of sleep and those regulating the autonomic balances. Evidence is offered that sleep is caused by an inhibitory action of the sleep centre on the waking centre. The lateral hypothalamic area seems to be of more importance for the regulation of sleep and waking than the inner areas. It seems probable that the median forebrain bundle which occupies this space is implicated in the transmission of impulses determining the sleep waking rhythm.

J P ROBB

Pantopaque Meningitis Disclosed at Operation. Tarlov, I M J Am Med Ass, 129 1014, 1945

To date pantopaque is the best media available for x-ray visualization of the subarachnoid space. However it is not free from dangers and the author reports a case in which a rather pronounced inflammatory response was found in the nerve roots of the cruda equina at operation, 60 hours after three c.c. of pantopaque was introduced intrathecally. During operation the dura and the arachnoid were opened and considerable whitish soft stringy exudate was seen

Microscopical examination showed a meshwork of fibrin strands with numerous imbedded polymorphonuclear leucocytes, lymphocytes, and plasma cells. The tissue was clearly inflammatory. Culture was negative. It was suggested that pantopique be used only in cases where critical information is needed for diagnosis and treatment. When it is employed it should be injected immediately before fluoroscopy is done, and should be removed immediately after the myelography, either by aspiration or the method described by Scott and Furlow (*Radiology*, 43:241, 1944).

J P ROBB

Use of Curare in Oil Treatment of Spasticity Following Injury of the Spinal Cord Schlesinger, B. *Arch Neurol & Psychiat*, 55:530, 1946

Aqueous solutions of curare have been shown to diminish hypertonia, tremor and involuntary movements in certain neurological conditions. The clinical effects, however, are transient, and there are some undesirable side effects at the height of its action such as masked facies, head drop, and mental confusion. In an effort to prolong the effect of tubocurarine chloride was suspended in a peanut oil white wax mixture mechanically (a 3% suspension of tubocurarine in a mixture of 4% white wax in peanut oil). The average dose was 1.25 ± 0.25 cc given deep in the gluteal muscle.

Eleven cases were treated with satisfactory results. The action of the curare was slow, and in some cases lasted up to three days. There were none of the undesirable side effects. One value of the drug was that with the relaxation, physical therapy was more effective, and skin ulcers healed. The effect on patients with some voluntary function masked by spasticity seemed more dramatic than the effect seen in paraplegic patients.

In one patient marked ulceration in the knee region healed spontaneously with relaxation of the adductor spasm. In another with regularly occurring mass movements with decubitus ulcers over the trochanteric and sacral regions and over the heels epitelialization occurred promptly with cessation of the constant friction.

J P ROBB

The Wernicke Syndrome Meyer, A. *J Neurol, Neurosurg & Psychiat*, 7:66, 1944

The Wernicke syndrome consists of mental symptoms characterized by confusion, hallucinations, and memory defect, and terminating in coma and death, combined with the pathological finding of a lesion in the hypothalamic area. It has been shown to be due to a thiamine deficiency, and has usually been associated with alcoholism. Of the author's five cases only one had alcoholism. Two had pernicious anemia, one gave a history of hyperemesis gravidarum, and the other had a gastric carcinoma. The last case is described in detail. In this case the oldest and severest lesion were localized in the anterior portion of the hypothalamus. A peculiar cerebellar lesion affecting predominantly the granular layer, was also present. In four of the five cases, the inferior olives were damaged in a characteristic way, neurones of the mediodorsal region undergoing homogenizing degeneration. Manic syndromes have been known to be associated with lesions of the anterior hypothalamus. Bard produced sham rage in cats whose cortex and cranial half of the hypothalamus had been ablated. He felt the mechanism responsible lay within an area comprising the caudal half of the hypothalamus and possibly the more ventral and caudal fraction of the corresponding segment of the thalamus.

The author's findings were in agreement with the experimental findings, and perhaps the lesions were clearer than those previously reported in human material. Although these cases are not often seen they are always of great interest as the hypothalamus plays such an important part in human physiology, and until recently very little was known about it.

J P ROBB

Therapeutics

Air Embolism and Pneumomediastinum in Artificial Pneumoperitoneum Simmonds, T. A. H. *The Lancet*, p. 530, April 13, 1946

Therapeutic pneumoperitoneum is a relatively safe procedure whose most dangerous complications are air embolism and pneumomediastinum. These occurred in only 9 patients in over 1,000 air injections into the peritoneal cavity. There was one fatality, due to injection of air into the liver and the production of air embolism. Short histories are given of all nine cases. The mechanism of air embolism of the brain following pneumoperitoneum is discussed. An impaired pulmonary circulation due to pulmonary air embolism may increase the probability of the passage of air through a patent foramen ovale. To avoid air embolism it is well not to operate on suddenly anxious patients, and not to hurry. When present the head is lowered and the collapse treated with warmth and stimulants. Mediastinal emphysema may arise by passage of air from the peritoneal cavity through a hiatus of the diaphragm beside the oesophagus or the aorta, and the air may even invade the lungs, so producing pulmonary interstitial emphysema by passage in a direction the reverse of that ordinarily recognized. In treating mediastinal emphysema the cardiac embarrassment should be relieved, oxygen and sedatives given, and the air, if necessary, aspirated from the mediastinum by cannula introduced through an incision made just above the manubrium sterni.

C C MACKLIN

Industrial Medicine

Weil's Disease Occurrence Among Workers in Welsh and Scottish Coal Mines Jenkins, T. H. and Sharp, W. C. *Brit M J*, p. 711, May 11, 1946

Among mine workers in Scottish and South Wales coalfields, cases of Weil's disease have occurred with such regularity and with such a high mortality rate that in certain types of mines this disease is considered a definite occupational risk. In the present article the authors discuss the incidence in these coalfields during the past few years, and recommend preventive measures.

A table presents the incidence in mines of known risk, together with pertinent data for each. These mines have direct access from the surface by levels, drifts or shafts, which are generally wet and infested with rats. The rats are possibly attracted to the mine by the horse feed. In most cases live rats caught in the mines were proved to harbour the *Leptospira*. It was isolated also from specimens of pit water and slime. All but one of the cases recorded were among underground workers. In nearly every instance the conditions of work were wet or necessitated traversing wet places.

That the incidence was sporadic in nature is accounted for by the fact that when a case occurs, particularly one that proves to be fatal, intensive rat extermination measures are undertaken for a time at least. Of the cases reported in the period under observation, approximately 33% were fatal.

The life history and habits of the sewer rat, *Rattus norvegicus*, and of the black rat, *Rattus rattus*, are given. The main carrier of the *Leptospira* is the sewer rat. The authors discuss the question of prevention, which is a matter requiring co-operation of the men and the management. The following measures are considered: (1) extermination of rats, (2) prevention of reinfestation, (3) rendering all food inaccessible, (4) drainage of water and/or rendering stagnant pools unsuitable for the organisms, (5) use of protective clothing, (6) prompt and effective use of first aid arrangements, (7) pit head baths.

The authors are of the opinion that the disease may be much more widespread than recorded cases indicate. In the early stages it is easily mistaken for other conditions. They quote a previous investigator who stated "It would be well if doctors dealing with patients

exposed to the special risks by occupation or accident would have a serum test done in febrile cases developing feverishness, muscular pains, conjunctivitis, and intestinal irritation, without waiting for jaundice to develop.

MARGARET H. WILTON

The Short Personnel Selection Interview Misselbrook B. D. *Occup. Psychol.*, p. 55, April, 1946

In this article the author, who is now lecturer in psychology in the University of Edinburgh, discusses the technique which he evolved for the conduct of a selection interview in naval establishments. He indicates that the general principles can now be applied in other environments. He gives a detailed explanation of the method of procedure and the significance of each phase, stressing the importance of the exploratory talk and the questionnaire, which covers previous occupations, education, hobbies and interests.

The main points in the article are summarized to include the following: (1) The interviewer is concerned in considering particularly how the candidate has functioned in the past and in estimating how he is likely to adapt and progress during a particular course and in the job which comes after its completion. (2) The interview must be flexible, with no suggestion of rushing. (3) Skill is necessary when "sight reading" a questionnaire. (4) The interviewer should attempt to use short questions which can easily be answered, but at the same time give the candidate opportunity to express himself with freedom and spontaneity. (5) A thorough knowledge of jobs in civilian life and in the Service is essential to successful selection. (6) Oral trade test questions and trade test pieces prove very useful in obtaining relevant information re a candidate's knowledge and suitability; photographs related to work processes, are also a help. (7) "Incidental" information obtained during an interview, i.e. the information obtained from expressive behaviour, must be interpreted with care.

The author stresses that too much emphasis cannot be placed upon the value of obtaining clear evidence, both to avoid misleading general impressions and to increase the validity of the selections made.

MARGARET H. WILTON

OBITUARIES

Dr Walter Howard Batten died on April 6 in Toronto. He was born in 1894, and graduated in medicine from the University of Toronto in 1918.

Dr Edward Ellis Binns, a prominent resident of Welland since 1907 died at the St Catharines General Hospital August 7, in his 66th year.

Born in Jamaica, he was educated by private tutors, taking Cambridge University examinations. His medical studies were carried out at the University of Toronto, where he graduated in 1904 with a Bachelor of Medicine degree. For the next four years he carried out post-graduate work, studying in hospitals at London, England, and in Vienna.

Dr Binns came to Welland and started practice in 1907. He had resided here ever since.

Dr Binns was a student of the classics and attained a high standard in Latin and Greek. He also spoke fluently several modern languages.

His interests outside of literature included a love of horse and dogs. He was an ardent horseman and golfer being a charter member of the Lookout Point Golf and Country Club. He was an adherent of the Church of England.

Dr Binns is survived by his widow his mother four sisters and two brothers.

Docteur Sarto Blanchard, président et membre d'honneur de l'Association des Médecins du Sacre-Cœur à Hull, est décédé le 17 août, après une longue maladie, à l'hôpital du Sacre-Cœur. Il était né à Grand'Mère, Q. B. en 1868.

Docteur Blanchard était aussi Chevalier de Colomb du 4^e degré de la section de Hull et membre de diverses autres associations.

Il a fait ses études au collège de Lévis et à la Faculté de Médecine de l'Université de Montréal. Il fut interne à l'Hôpital Saint-Lazare et à l'Hôpital du Sacre-Cœur à Hull. Il fut reçu médecin en 1899.

Lui survivent son épouse, deux fils, un fill, cinq frères et une sœur.

Dr Thomas Henry Callahan died on August 14 at his home in Toronto.

Born in Wooler, Ontario, Dr Callahan received his elementary education there and in Trenton where he attended Trenton high school. In 1907 he graduated from the University of Toronto. Until 1918 he practised medicine in Kitchener and was staff abdominal surgeon for St Mary's Hospital there. In 1918 he became associated with St Michael's Hospital. For the past seven years he had been a member of the Ontario Cancer Commission.

The little leisure Dr Callahan was able to take from hospital and surgical duties he devoted to the activities of the Canadian Club, the Granite Club and the Knights of Columbus. He was breeder of the mare Mona Bell, runner up in the King's Plate of 1938.

Dr Callahan had five sons serving with the Canadian forces during the Second Great War.

Surviving are his widow, six sons, three daughters, two brothers and one sister.

Dr Frank Daniel Charman died suddenly at Truro, N.S. on August 10. His unexpected passing came as a deep shock to a wide circle of friends in Truro and vicinity and throughout the province.

A native of Wallace, Dr Charman went to Truro about twenty years ago. He graduated from McGill University in 1904 and practised in Wallace before going to Truro. He was highly respected for his kind, friendly nature, especially among the younger doctors who went to Truro to practise, and who received his ready, helpful hand.

The late Dr Charman lived quietly, his whole life was taken up in his work and his family. He was keenly interested in the health of the community and in the hospital. Survivors include his widow, two daughters, and a son, Frank, a student at McGill University and a number of brothers and sisters.

Dr Gordon Grote Copeland died on May 1 in Toronto. He was born in 1885 and graduated in medicine from the University of Toronto in 1911.

Dr Oscar Chipman Dorman died on August 13, 1946, aged 74 at his home in Winnipeg after a brief illness.

Born at Inuit-port, N.S. of Irish parents he received his early education there and graduated in medicine from Dalhousie University. Later Dr Dorman took post-graduate study at Edinburgh and London and then practised in Winnipeg for forty-five years. He is survived by his widow and three daughters.

Dr Charles Edward Duggan died on December 20 in St. David's.

He graduated in medicine from Trinity in 1903.

Dr John Henderson Duncan, aged 58, died in Sault Ste. Marie August 7.

He had been in poor health since his recent trip to Banff and had returned to the Sault to recuperate at his summer home at Diamond Lake. He had been home for about 48 hours when the fatal heart attack occurred.

Born in Churchhill, Ontario, Dr Duncan was a graduate of the University of Toronto in 1915. During his practice he specialized in orthopedic surgery. He studied for a year in the Sick Children's Hospital in Toronto. He took an ardent interest in x-ray work. He practised in Bruce Mines from 1915 to 1919 when he moved to the Sault.

He was an active member of the Country Club, the Masonic Lodge, was chairman of the Collegiate Board in 1945 and until his death was a member of the Board of Education.

Dr Duncan was chief obstetrician and gynecologist at both local hospitals. He commenced x-ray work at the General Hospital, a work which he continued until 1929.

He is survived by one son and one daughter.

Dr Walter Wodehouse Geikie died on August 10 at Toronto Western Hospital after a brief illness. He was in his 90th year.

Dr Geikie was well known in Toronto, where he practised for many years, and in Elmira, where he served as coroner for Waterloo. Born in Aurora, he was educated at the famous Dr. Tassie's Grammar school in Galt, and at Upper Canada College. In 1875 he graduated from Trinity Medical College, where his father, the late Dr. W. P. Geikie, was dean.

Dr Geikie is survived by a daughter and two sons.

Dr David Yale Greene died on April 2 in Windsor, Ontario. He was born in 1899, and graduated in medicine from the University of Toronto in 1923.

Dr Thomas A. Hamilton, died at his home in Brinston, Ontario, August 1 after a brief illness, in his 46th year. He was a graduate of medicine of Queen's University in 1924.

He spent one year at Puckasau, in Thunder Bay district, then came to Brinston, where he has been general practitioner until about a month ago, when he became ill. In addition, he was chief coroner for Dundas County and an assistant Medical Officer of Health for the Three United Counties' Health Unit.

Surviving besides his parents and his wife are one son, one daughter, one brother and one sister.

Dr Ross G. Howell died on April 15 in Jarvis, Ont. He was a graduate in medicine of Victoria in 1889.

Dr Wilfrid Jacques, de Sainte Marie de Beauce, est mort le 31 juillet à l'âge de 59 ans, après une longue maladie.

Dr Jacques fit ses études classiques au collège de Ste Anne de la Pocatière, et après de brillantes études à la faculté de médecine de l'université Laval, il fut admis à la pratique de la médecine en 1910.

Il laisse sa femme, ainsi que deux filles et deux fils.

Dr Edmund Patrick Kelly, aged 72, died suddenly on July 30 at his home in Oshawa, Ont.

Born in Toronto, Dr Kelly graduated from Trinity in 1897 and first began practising medicine in Orillia. Later, he continued his work in Northern Ontario, before joining the staff of General Motors in Oshawa. He retired about two years ago. He was a member of Our Lady of Lourdes Roman Catholic Church in Toronto.

Dr Kelly was a Licentiate of the Royal College of Physicians, Edinburgh, and L.R.C.P.S., Glasgow.

Surviving are one sister, one brother, and two nephews.

Dr Archibald Forbes Laird died on October 18 in Owen Sound, Ont. He was born in 1889, and graduated in medicine from the University of Western Ontario in 1913.

Dr Alex Lefurgey died at Alberton, P.E.I., on August 21. He is survived by his widow, two sons and two daughters.

Dr James George Keber Lindsay, Registrar of the College of Physicians and Surgeons of Saskatchewan died on August 14, at the age of 44, following a week's illness from a coronary attack.

Dr Lindsay was born at North Bay, Ontario, on June 9, 1902. He graduated with distinction from Queen's University in 1927, and obtained his Dominion Council the same year. Following a year's postgraduate work in the Vancouver General Hospital, he returned to Queen's University for one year as lecturer in embryology and physiology on the Faculty of Medicine. He entered private practice at Lunenburg in 1929, where he remained until 1936. While at Lunenburg he won the love and esteem of the entire community, by his untiring devotion to his work and his leadership in church and community life.

In 1936 Dr Lindsay was persuaded by his colleagues to give up the active practice of his profession, to become Registrar of the College of Physicians and Surgeons of Saskatchewan. On July 15, 1940, he was given leave of absence and joined No. 8 Canadian General Hospital of which he shortly became Registrar, and proceeded overseas with the unit in March, 1942. During his entire service Dr Lindsay earned the reputation of being one of the most capable administrators in the Royal Canadian Army Medical Corps. He was distinguished by his loyalty, reliability, and unselfish devotion to duty, and to the welfare of the personnel and patients under his command, which earned for him the award of Member of the British Empire.

After proceeding with his unit to Normandy, and through its various moves until the hospital was stationed in Antwerp, Dr Lindsay was promoted to the rank of Lieut. Col., and was given command of No. 3 Canadian Casualty Clearing Station. He commanded this unit in a far forward position until April, 1945, when he was promoted to the rank of Colonel and given command of Roman War Convalescent Hospital, which he retained until this unit was demobilized following the cessation of hostilities. He returned to Canada and was discharged from the army in September, 1945, and resumed his duties as Registrar of the College of Physicians and Surgeons with residence in Saskatoon.

He took up his work as registrar with vigour, enthusiasm, and a profound understanding of the problems facing the profession. He was tireless in his efforts to help in the development along sound lines of improved health services. His counsel was invaluable in the varied and important consultations of the profession with Government and other groups. Dr Lindsay was alert to the needs of the profession and the people of the province, and by his frankness and earnestness won a higher place for his profession in the esteem of the public. He was methodical and painstaking in his approach to the various problems, and was continually setting new and higher standards of attainment.

Dr Lindsay is survived by his widow, and five children.

TACK F. C. ANDERSON, M.D.

Dr George S. MacCarthy, aged 74, well known for his work in tuberculosis, died in hospital in Ottawa, August 13.

A victim of tuberculosis several years after graduation from McGill in 1895, he recovered and later organized an anti-tuberculosis society.

In 1905 he saw the first Ottawa sanatorium, the Lady Grey, established.

He was a member of the General Medical Board of the Ottawa Civic Hospital from its establishment. He was chairman of the hospital's Advisory Board and a trustee for several years, until his retirement from these duties in 1941. He was long a consultant in surgery at the Civic.

Dr MacCarthy also acted as examiner for the Medical Council of Canada, and in 1910 was appointed member of the Council. The same year he was made an honorary member of the Ontario Medical Association. He was a director of the Canadian Medical Protective Association and of Associated Medical Services, Limited.

was a past president of the Ottawa Medical-Chirurgical Society and the Ottawa Medical Society.

During World War I, Dr. McCarthy served four years in the region with the R.C.A.M.C., in command of two hospitals in Ottawa and Petawawa. He received with the rank of Lieut. Col. and the Victorian Decoration Long Service Medal.

In 1942 the Graduates' Society of McGill University made him an honorary member, placing him in the ranks of Clarence Webster, Stephen Leacock, Sir Edward Pratt and Lord Tweedsmuir. He had been both president and honorary president of the Ottawa Valley McGill Graduates' Society.

Travel was one of Dr. McCarthy's chief pleasures and every year for 11 years before the war he made a trip to England. His other favourite recreations were curling at the Rideau Curling Club, golf at the Royal Ottawa Golf Club, and fishing at McGregor Lake. He had been a member of the Country Club for more than 20 years.

He is survived by his widow, one son, two daughters and four sisters.

Dr. George McNeill, radiologist, died at his home in London, Ontario, on July 29, aged 65.

Dr. McNeill was born in London and received most of his education there. Throughout his lifetime he did much of his work in surgery and radiology in that city. In addition, he held offices in medical societies in Canada and the United States.

He graduated in medicine from the University of Western Ontario in 1902 and the following year was appointed house surgeon for Victoria Hospital. In 1907 he became radiologist for that hospital and continued in that capacity until 1940.

He was a director of the Ontario Institute of Radio Therapy from 1931 to 1940 and in 1928 he attended a meeting of international radiologists in Stockholm as the Canadian representative.

He is survived by his widow, one son, and two sisters.

Dr. Albert Ernest Medd died suddenly at his home in Winnipegosis on August 13, 1916. Born in Wolseley, Sask., 60 years ago he moved with his family at an early age to Brandon. In 1909 he graduated in medicine from Manitoba Medical College and went to Winnipegosis where he practised continuously till his death.

Dr. Medd was in the first rank of rural practitioners. He carried on a large private practice and was the medical officer of five Indian reserves. Dr. Medd took a keen interest in community work. He was chairman of the school board, health officer and a member of the Masonic and Elk order.

Besides his widow he is survived by three sons and two daughters.

Dr. William Morin, est décédé à St. Hyacinthe le 18 août, après une longue maladie. Il était âgé de 78 ans et 11 mois. Il avait exercé sa profession pendant plus d'un demi siècle.

Le Dr. Morin était né à St. Hyacinthe. Il avait fait ses études classiques au collège Sainte Marie de Monrovia et sa médecine à l'école de médecine Victoria, de Montréal. Il avait d'abord exercé sa profession à St. Hyacinthe, dans le comté de St. Hyacinthe, puis à St. Hyacinthe.

Il laisse son épouse, six fils et trois filles.

Dr. T. H. Prust died at his home in Peterborough, Ont., on August 15. A native of Blackstock, Ont., Dr. Prust was educated at Port Perry and Lindsay, and graduated from Trinity College, University of Toronto, in 1897 with his doctor's degree. He practised four years in Pontiac, Mich., then moved to Grenfell, Sask., where he remained for eight years before coming to Edmonton in 1912. He left here in 1940 to make his home in the east.

He was married to Miss Florence A. Prust, nee McNeill, in 1921. He had one son and two daughters.

He is survived by his widow.

Dr. J. E. Poubielle est décédé à Ste. Juste, Que., le 5 août, à l'âge de 67 ans. Il pratiquait la profession à Ste. Juste depuis 40 ans. Dr. Poubielle a fait ses études classiques au collège de Lévis et sa médecine à l'université Laval. Docteur fin, un frère et une sœur lui survivent.

Dr. Victor Poss died on August 9 at the General Hospital, Hamilton, Ontario. Born in Guelph, Ont., he came to reside in Hamilton in 1907. A graduate of the University of Toronto in 1909, he took a post-graduate course in Middlesex Hospital, England. He was a member of MacNab Street Presbyterian Church.

Surviving are his widow, two brothers and two sisters.

Dr. Robert Marshall Rutherford died on August 14 at Hawkesbury, Ont. He graduated in medicine from McGill University in 1899.

Dr. Dunstan Smith, a graduate of the Faculty of Medicine of McGill University, 1914, died at his home in Ste. Anne de Bellevue, Que., on July 27 after an illness of five months. He was in his 25th year.

Dr. Smith received his early education at MacDonald High School, Ste. Anne de Bellevue. He joined the Army upon graduation from medicine in 1914. He served his internship at St. Mary's Hospital following enlistment, but was discharged from the forces after nine months. Subsequently he went to Tulane University, Louisiana, on a Fellowship in Surgery. He returned to his home last winter.

He is survived by his parents.

Dr. James Cameron Smith died suddenly of a heart attack at his home in Peterborough, Ont., on August 5. He was born in China. He was a graduate in medicine of Queen's University, Kingston, and had practised his profession in Lakeshield for the last 28 years. Dr. Smith was widely known throughout the county and especially in its northern section where unsparingly he had attended many patients in season and out since his coming to the district in 1918.

Dr. Smith is survived by his widow, two daughters, three sons, and a brother.

Dr. Stanfell F. A. Wainwright, of Fredericton, N.B., died on August 16, while visiting his sister in Victoria, B.C. Dr. Wainwright was born in St. Andrews East, Quebec in 1874, and graduated in medicine from McGill in 1897. His first practice was in Stanley, N.B. In 1910 he moved to Fredericton where he was continually active till this year, when he retired. He was always interested in the Fredericton Medical Society, New Brunswick Medical Society, and the Canadian Medical Association. In 1943 he was made a Senior Member of the Canadian Medical Association. He was closely associated with Christ Church Cathedral in Fredericton and was respected as a good citizen and kindly physician. In attire and personality Dr. Wainwright always exhibited the dignity admired in a profession, but frequently absent in the bustle of a hectic present day practice.

Surviving are his widow, four daughters and one brother.

Dr. Wesley Edgar Wallwin died on May 10 at Niagara on the Lake, Ont. He was born in 1881 and graduated in medicine from the University of Toronto in 1905.

NEWS ITEMS

Alberta

The offices of the College of Physicians and Surgeons of Alberta, and the Canadian Medical Association, Alberta Division, have moved from Calgary to Edmonton. All future correspondence should be addressed to, The Registrar, College of Physicians and Surgeons of Alberta, 10 Merrick Building, Jasper Avenue, Edmonton, Alberta, or The Secretary, Canadian Medical Association, Alberta Division, 10 Merrick Building, Jasper Avenue, Edmonton, Alberta.

Dr Charles E Camsell of Ottawa was honoured in Edmonton on August 26 when the former Jesuit College was officially opened as a hospital for tuberculous Indians. His excellency, Field Marshal, the Rt Hon Viscount Alexander of Tunis, Governor General of Canada, officially opened the hospital which is to be known as the Dr Charles Camsell Hospital. Dr Camsell was for years with the Department of Mines and Resources. Since his retirement, he has been acting commissioner for the Northwest Territories. He has always been keenly interested in the welfare of Canadian Indians.

A new municipal hospital was officially opened on August 27, 1946 at Ponoka. The Matron, Miss Ivy Murrell, cut the ribbons and declared the building open. Speakers included the Minister of Health, Dr W W Cross, Mr E E Maxwell, Supervisor of Municipal Hospitals, Deputy Mayor Gannlund, Reeve M Ginnadall, and P MacDonald. An address of welcome was given by Mr E Filzogen. Ponoka is the 31st municipal hospital to enter operation. It will have a staff of seven nurses, and is modernly equipped.

Sixty seven applications for registration are to go before the September meeting of the Council of the College of Physicians and Surgeons of Alberta. The majority of these are men recently released from the forces. Several are applying for registration in order to take advantage of the reciprocity with the General Medical Council of Great Britain, where they are planning on taking postgraduate courses during the coming year.

A revised provincial schedule of fees has been prepared and will be marked shortly. Practitioners are being asked to review this schedule and be prepared to approve it at the next annual meeting of the College of Physicians and Surgeons of Alberta.

A new Workmen's Compensation Board schedule has also been prepared, and should be in the hands of the practitioners in the near future.

The thirty bed hospital at Rocky Mountain House has been sold to the Municipal Board representing the town and municipality of Riverton and three local improvement districts.

Dr A H Baker, superintendent of the Provincial Sanatorium and president elect of the Canadian Tuberculosis Association, will address the annual meeting of the Montana Tuberculosis Association to be held in Helena, September 7, 1946.

Doctor George R Johnson of Calgary, for many years Registrar of the College of Physicians and Surgeons of Alberta, was elected President of the Dominion Medical Council at the annual meeting held recently. He succeeds Dr Stanley Kirkland of Saint John, N.B.

G E LEARMONTH

British Columbia

Lieut Col J S McCannell, O B E, has recently been posted to Headquarters, Military District 11, as District Medical Officer. Prior to 1939 Col McCannell was in

practice in Victoria, B C. He enlisted with No 13 Canadian Field Ambulance in September, 1939 and went overseas in 1942. He commanded No 24 Canadian Field Ambulance in Italy, and in Northwest Europe, and later served as A D M S, First Canadian Army in Holland.

Mr E S H Winn has resigned as Chairman of the Workmen's Compensation Board of British Columbia after a thirty year tenure in office. Mr Winn leaves an enviable record of accomplishment in his position. The medical profession view his departure from office with regret.

Dr John Nav, who for many years has served as Chief Medical Officer of the Workmen's Compensation Board of British Columbia, has also resigned. Dr Nav filled a difficult position with wisdom and ability, and he has enjoyed the respect and confidence of the doctors of this Province. On retiring from office we wish him many long and happy years in which to enjoy the leisure so well deserved.

Dr Nav will be succeeded by Dr John F Haszard. On assuming his new duties Dr Haszard has the best wishes of the medical profession in the Province. He brings to the task a wealth of valuable experience that assures his success. Prior to the war he had a large industrial practice at Kimberley, B C. He enlisted for active service at the outbreak of hostilities in September, 1939, and served with distinction until late in 1943. He commanded No 5 Canadian Field Ambulance, then No 16 Canadian General Hospital in Europe. Later he served as A D M S of various formations in England before returning to Canada in 1945.

Several eminent authorities in the field of medical education have visited Vancouver recently at the request of the University of British Columbia authorities. They have been studying questions relating to the establishment of a Medical School here. Among these have been Dr E W Goodpasture, Dean of Vanderbilt University School of Medicine, Nashville, Tennessee, Dr Alan Gregg, Director of the Division of Medical Science of the Rockefeller Foundation, Dr Ray Parquharson, President of the Royal College of Physicians and Surgeons of Canada, Dr J T Ower, Dean of the Faculty of Medicine, University of Alberta.

A branch of the Defence Medical Association is being organized in the Province for active and retired medical officers of the three armed services.

Mr Graham L Davis, Hospital Director of the Kellogg Foundation and Dr John Grant of the Rockefeller Foundation have recently been in British Columbia at the request of the Provincial Government they are making a survey of the hospital situation in the Province.

Plans are now complete for the Summer School of the Vancouver Medical Association, which is being held September 9 to 13 inclusive. There is a very full and interesting program, and a record registration is anticipated.

M R CAVERTHILL

Manitoba

Dr E J Rutledge, M L A, of Erickson, who has been municipal doctor of Clanwilliam municipality for the past 25 years, has resigned his post as from September 15. He will take up residence in Winnipeg. Dr Rutledge was the first municipal doctor in Manitoba, and for 19 years represented the constituency of Minnedosa in the Legislature. His successor has not been named.

The municipal officers of Erickson have held a meeting to discuss the erection of a hospital. Dr E J Rutledge addressed the meeting and recommended a ten bed hospital with x ray equipment and a doctor's

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office. The area to be served by the proposed hospital will include Churchill municipality, ward 6 of Harrison municipality, and the unorganized territory north of these municipal boundaries.

Dr James Osborne, aged 22, an honours graduate in medicine of Manitoba University, 1946, and his young wife left Winnipeg on August 12 by airplane for Churchill. There they will board the supply ship *Nascope* which after a five weeks' journey will bring them to Pangnirtung, Baffinland. Dr Osborne will be the government medical officer in the far north. He will be in charge of the 25 bed hospital staffed by two white nurses. Contact by two way radio is carried on between Dr Osborne and Dr P E Moore, Department of Indian Affairs. The radio is also used to advise medical treatment for Eskimos who are unable to be brought in for treatment due to weather conditions.

Dr Robert Yule, medical superintendent for Northern Manitoba Indians on a recent visit to York Factory on Hudson's Bay, saved the life of a two months' old Indian child with penicillin. The grateful parents spread the news that the white man's medicine was good, with the result that 175 of the 350 natives living at York Factory presented themselves for immunization. Last year only 25 could be persuaded to accept the injections. ROSS MITCHELL

New Brunswick

Dr George E Madison of Moncton has been appointed consultant in tuberculosis at the newly opened Veterans' Hospital at Sussex. Dr Madison is a graduate of Dalhousie Medical School, 1937 and received his Diploma in Public Health from Toronto in 1939. He has done special work in tuberculosis at Trudeau Sanatorium and with the Alabama State Health Department.

Dr F H George has established a practice in Saint John after a long service overseas, with the Royal Canadian Army Medical Corps.

Dr H D Reid for many years superintendent of the Lancaster Hospital, Department of Veterans' Affairs has been transferred to Ottawa on promotion. Dr Reid was stationed at first in Saint John with the Department of Pensions and National Health on quarantine and Immigration service, and gradually assumed the duties at Lancaster Hospital, which has grown to its present capacity under his direction. During the war years Dr Reid's responsibilities in the Port of Saint John and the Lancaster Hospital were discharged with ability and splendid co-operation with all the armed services. Dr Reid was always a regular attendant at the meeting of the Saint John and New Brunswick Medical Societies. His friends in the Maritimes wish his continued success in his new appointment.

Infantile paralysis is again a threat in this province. A small number of cases have been reported and the public health authorities headed by Dr J H Melanson, chief Medical Officer have broadcast by radio and through the press advice to the public relative to the disease, and the necessity of early treatment.

Dr F C MacArthur of Moncton, has begun practice at Hatfield's Point. This location was for many years the responsibility of the late Dr Thomas Fraser.

Dr A L Windsor has returned to his practice in Norton after six years' service in the R C A M C.

A S KIRKLAND

Nova Scotia

An action is reported pending against the Harbor View Mines Hospital, Sydney Mines. From press reports it would appear that a patient was admitted there

for treatment of an injured thumb. Novocaine was to be used as a local anesthetic. The physician in charge was given a solution for injection which he took to be the local anesthetic, but which appears to have been adrenalin. Death followed shortly afterwards.

The Cape Breton District Command of the Canadian Legion is urging the need of a full time pathologist for that area to facilitate the service now given by the Pathological Institute, Halifax.

In New Waterford, improved first aid measures to be adopted in dealing with mine injuries have been suggested by the medical profession there through Dr F J Barton. Among the changes suggested were the establishment of blood banks in the local hospitals, distribution of trained first aid personnel throughout the mines in key positions, and the early administration of morphine.

The Red Cross has established the Bayview Memorial Outpost Hospital at Advocate Harbour under the direction of Dr M J Tillmore.

Dalhousie University has announced the appointment of Dr W Alan Curry as Head of the Department of Surgery and Dr Clyde W Holland as Head of the Department of Medicine, with Dr D J Tonning as Assistant. Dr Robert Begg who following his discharge from the R C A M C pursued postgraduate studies at Oxford University is to be Assistant Professor of Biochemistry.

Nova Scotia has been singularly free from cases of infantile paralysis which has been troublesome in New Brunswick and Prince Edward Island. August was a particularly rainy month with no hot days which may have been a contributory factor. All cases this year have been at widely separated points and there have been no deaths. The clinic at Woodside under the direction of Dr C E Kinley continues its excellent work.

H I SCAMFELL

Ontario

The Academy of Medicine Toronto has moved into its new quarters at the corner of Huron Street and Bloor Street West. It is in the same block with the Medical Arts building and the parking yard of the latter will be a real convenience to the Fellows. The building was a large residence and a great deal of work has been done to convert it to the uses of the Academy. There is ample room for the construction of an auditorium at a later date. The library will occupy the first floor. The stacks are located in adjoining rooms and the librarian's office is in the old drawing room of the house. South windows make it a pleasant place in which to work.

The business office and auditorium are on the first floor. The auditorium will seat about one hundred people. For stated meetings the University has allowed the use of the fine meeting hall of University Schools which is situated on the opposite corner of Bloor Street. On the second floor is the telephone switch boards where five operators handle the service. An attractive rest room is provided for the operators.

The new site has many advantages over the old Osler Hall and the space for storage stacks will be missed until they can be replaced. The large collection of pictures and portraits cannot be displayed until additions are built, so most of it will be packed away for a time. Opening ceremonies are arranged for October 1.

The programs for the annual district meetings of the Ontario Medical Association began in Port Arthur. Fort William on September 5, 6 and 7. Clinical demonstrations were given by Drs J L McDonald, E C Steele and T A Ireland of Toronto and Drs Ivan H. Smith and C H Chene of London. Dr C C White



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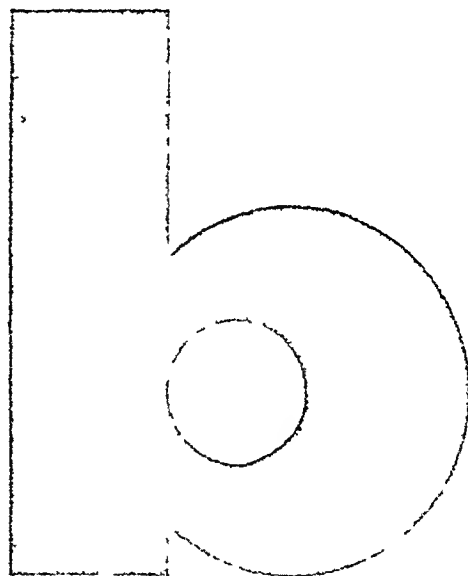
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of Chatham, President Elect of the Association addressed the meeting and arrangements were made by Dr W P Hogarth Counsellor for the district and Dr P M Ballantyne and W G Robinson Vice counsellors. The agenda for the business session occupied a long half day on September 6.

A two day session of District No 9 was held in Timmins September 9 and 10 under Dr A L Crang of Sudbury, Counsellor, Dr E H Pratt, Sault Ste Marie and Dr M J Kelly, Timmins, Vice counsellors. The business session held on September 10 was followed by a luncheon to which the ladies were invited. The visiting speakers were Dr H M Coleman of Toronto who spoke on "Traumatic lesions of the knee joint", Dr R I Harris of Toronto who discussed "Compound fractures", Dr Norman M Wrong of Toronto whose subject was "Recognition and treatment of common skin diseases" and Dr W Hurst Brown of Toronto who presented "Some recent advances in medicine". The dinner meeting was addressed by Rev. Anne Shipley of Timmins and Dr C C White President elect. A dance followed the dinner.

Other district meetings held in September were Oshawa September 18, Belleville September 24 and 25, Ottawa September 26 and Brockville September 29.

The City Council of London, Ontario, passed a resolution at a session early in August expressing its appreciation of a gift from Dr W J Stevenson of \$75,000.00 to the University of Western Ontario for the erection of a Medical Library. The Library Building is to be known as the H A and W J Stevenson Memorial Medical Library. The late Dr H A Stevenson was a former mayor of the City of London and Dr W J Stevenson is a former member of the City Council. It is hoped that Dr Stevenson may live to see the building and opening of the new Library which his generous gift has made to be possible.

M. H. V. CAMERON

The following additions have been made to the Register of the College of Physicians and Surgeons of Ontario for August, 1946: Ian Stewart Houston Harper, Toronto, Morris Michael Culner, Toronto, William George Green, Hamilton, Airon Lix, Toronto, Robert Kennedy Smiley, Ottawa, Keith Duncan McQuinn, Ottawa, John Lloyd Silversides, Toronto, William Keith Cameron, Weston, William Thomas Boyd St Catharines, Harry Hotz, Hamilton, Philip Ernest Doyle, Toronto, George Kenneth Ingham, Stratford, Benjamin Reid Townsley, Ingersoll, Harry Lloyd Bower, London, Julius Martin Ennis, Toronto, Fwen Pollock Carruthers, Ottawa, John Archibald McNeill, Peterborough, William Keith Freeborn Russell, Toronto, William Allan Taylor, Windsor, John McNeil Trush, Cochinne, James Kenneth Whittall, Caledonia, John Frederic Peterson, Kingston, Hans Hirschmann, Neys, Franklin John Squires, Angus, Duncan Elbridge Murdoch Campbell, Glen Miller, Derrald Lockhart Cameron, Bingham, Kingston, Howard Fletcher King, Kenora, John Adam McLachlin, London.

Quebec

Le ministère de la Santé et du Bien-Être Social a confié une mission d'une extrême importance au Dr Armand Frappier, directeur de l'Institut de Microbiologie et de l'École d'Hygiène de l'Université de Montréal. Il s'agit d'une enquête sur place des conditions favorisant la tuberculose chez les Indiens du Nord de la province de Québec et de rechercher les moyens de promouvoir chez eux la vaccination par le BCG. Le Dr Frappier et son équipe se rendent au grand rassemblement indien de Waswanipi au lac Chibougamau.

La Fondation Rockefeller vient d'accorder une bourse d'études au Dr Gustavo Charest, médecin hygiéniste à la division des maladies contagieuses du service de

santé de la Ville de Montréal pour lui permettre de poursuivre des études spéciales en épidémiologie à l'hôpital Herman Kiefer de Detroit et à l'école d'Hygiène publique de l'Université Johns Hopkins.

Durant les six premiers mois de 1946, les services de la Ligue anti-tuberculeuse de Montréal ont radiographié 56,201 personnes. Ces examens ont été faits par les techniciens de la Ligue dans 110 établissements et ont été pratiqués sous la direction du Directeur médical. On a trouvé 817 cas suspects, 1,236 cas positifs, 264 cas modérément avancés et 34 cas avancés.

Un hôpital de 35 lits sera bientôt ouvert à St-Eleuthère dans le comté de Kamouraski. Il sera désigné sous le nom d'Hôpital St-Joseph du Lac. Le Dr Rodolphe Monette en sera le directeur.

Des ruines de l'incendie de 1913, l'Hôtel Dieu de Tricard est maintenant ressuscité. L'inauguration officielle du nouvel hôpital eut lieu le 24 juillet.

L'hôpital du Sacre-Cœur de Hull est exproprié depuis le 13 juin dernier et doit forcément trouver un autre logement. Les autorités municipales de Hull ont accordé un terrain à la limite de la cité, au nord-ouest, dans la paroisse de St-Raymond. L'immeuble qui sera construit à cet endroit sera très considérable et comprendra un hôpital d'environ 300 lits et une maison pour les gardes malades. Le coût dépassera deux millions.

JEAN SANCIEP

Up to the middle of September, the epidemic of poliomyelitis in the Province of Quebec has caused about 550 cases, a little more than half of which were in Montreal. The epidemic is now definitely past its peak and with the cool weather is expected to drop sharply before the end of the month. The disease seems to have followed its usual pattern but full epidemiological details will be given later on. The mortality has been less than 5%.

Saskatchewan

The medical profession in Saskatchewan still deeply mourns the untimely death of their very capable and very popular Registrar and Secretary of the Association Dr J G K (Kocher) Landsay.

The construction of the new 350 bed wing, in addition to the Regina General Hospital, is proceeding according to schedule. We are told that the building should be ready for occupancy early next summer.

The new addition to the Grey Nuns Hospital in Regina to house the Saskatchewan Cancer Commission Clinic, as well as 150 beds is being built as quickly as skilled labour and building material will permit. Our information is that the ground floor will be ready for the Cancer Clinic to move in from its present location by Christmas, and that the building will be completed early next spring.

Major William Slack R.C.A.M.C., has taken over the duties of the D.M.O. at the Regina Depot.

Dr M G Malouf has recently returned from post graduate at the Polytechnic in New York and is taking up office space in the McCallum Hall Building, where he intends continuing his practice to proctology.

B. BRACKMAN

General

The Ninth Annual Louis Gross Memorial Lecture will be delivered, under the auspices of the Montreal Clinical Society at the Jewish General Hospital, Montreal on Wednesday, October 23, 1946, at 8:30 p.m. by Dr Roy R Gunkel, Director of the Institute for

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Psychosomatic and Psychiatric Research and Training of the Michael Reese Hospital, Chicago. The subject will be "Psychiatric objectives of our times".

Closing Date May 15, 1947—The \$34,000 prize contest for physicians' art work on the subject of "Courage and devotion beyond the call of duty" will be judged at the Atlantic City Centennial Session of the American Medical Association at Atlantic City, June 9 to 13, 1947. Art works on other subjects may also be submitted for the regular cups and medals. For full information write Dr F H Redewill, Secretary, American Physicians Art Association, Flood Building, San Francisco, Calif or to the sponsor Merd Johnson & Company, Evansville 21, Indiana, U S A.

Allotment figures to the States for the five year hospital construction program authorized in the Hospital Survey and Construction Act (Public Law 725) have been released by Surgeon General Thomas Parran of the United States Public Health Service. The Act authorizes the appropriation of \$3,000,000 for Statewide hospital surveys and for planning of construction programs, and \$75,000,000 annually for five years for the actual construction of hospitals and related facilities.

Of these amounts authorized, only \$2,450,000 has been appropriated to date. This is earmarked for assistance to States in surveying and planning and for administrative expenses of the U S Public Health Service in connection with this program. The share to which each State is entitled from the \$3,000,000 authorization for survey and planning expenses is based solely on State population. For determination of the distribution of the \$75,000,000 authorized for construction, a formula is used which takes into consideration both the population and the per capita income of each State. The allotments to the several States based on appropriations authorized in the Act are contingent upon Department of Commerce certification of population data.

Limited Supply of Bound Volumes 1, 2 and 3 of the Quarterly Review of Obstetrics and Gynecology now Available—During the past two years, and particularly the past few months, there has been an increasing demand for Volume 1, 1943, Volume 2, 1944 and Volume 3, 1945, of the Quarterly Review of Obstetrics and Gynecology.

The shortage of paper and other supplies as well as the greatly increased printing cost prevent the reprinting of a supply to meet all demands, as this cannot be done profitably. In an effort to cooperate with those who desire complete volumes, there are now being printed 1,000 sets of these in permanent bound volumes. These are available at the original price of \$25.00 for the set, resulting in the accepting of a loss on each set sold.

Those desiring complete volumes should communicate immediately with the Washington Institute of Medicine, 1720 M Street, N W, Washington 6, D C.

Lieut-Col C W Gilchrist, OBE, ED, former chief of Canadian Army public relations in the Mediterranean theatre and in northwest Europe, has been appointed by the federal Civil Service Commission as director of the Information Services Division for the Department of National Health and Welfare.

Announcement of Van Meter Prize Award—The American Association for the Study of Goitre again offers the Van Meter Prize Award of Three Hundred Dollars and two honourable mentions for the best essays submitted concerning original work on problems related to the thyroid gland. The Award will be made at the annual meeting of the Association which will be held in Atlanta, Georgia, April 3, 4, and 5, 1947 providing essays of sufficient merit are presented in competition.

U S Secretary of War Appoints Medical Advisory Committee—Secretary of War Robert P Patterson recently announced appointment of a medical advisory committee to the Secretary of War, to maintain and foster close relations between civilian and Army medicine, and to enable the Army to receive advice on Army medical organization and policies from leaders in civilian medicine.

Members of the new committee are Dr Edward D Churchill, of Boston, Chairman, Dr Elliott Cutler, Moseley Professor of Surgery at Harvard University, Dr Michael DeBakey, of the Tulane University Medical School, Dr Eli Ginsberg of Columbia University, Dr William C Munninger, Director of the Menninger Clinic, Topeka, Kansas, Dr Hugh J Morgan, Professor of Medicine, Vanderbilt University Medical School, and Dr Maurice C Pineoffs, Professor of Medicine, University of Maryland.

During the war, more than 95% of Army doctors were drawn from civilian medicine. Most of these, except recent graduates of the Army Specialized Training Program, have been released from the Army and have returned to their civilian practices.

Major General Norman T Kirk, Surgeon General of the Army, previously announced a policy under which distinguished civilian doctors will serve as consultants in their respective specialties in Army general hospitals.

BOOK REVIEWS

Acetanilid M Gross, Research Assistant (Assistant Professor) Laboratory of Applied Physiology, Yale University. 155 pp \$3.00 Hillhouse Press, New Haven, 1946.

This monograph constitutes a careful and critical analysis of the literature pertaining to acetanilid. It is the first of a series of monographs to be published by the Institute for the Study of Analgesic and Sedative Drugs. The subject is very thoroughly covered and this book, while of minor interest to the general physician, is of value as a reference work.

Agnosia, Apraxia, Aphasia T M Nielsen, Associate Clinical Professor of Medicine (Neurology), University of Southern California. 2nd ed, 292 pp, illust \$5.00 Paul B Hoeber, Inc, New York, 1946.

In this monograph Dr Nielsen has presented the case for the cerebral localization of various types of agnosia, apraxia and aphasia. Some have a high degree of localizing value and others are of little or no value. He has presented the evidence clearly and well for those that are of localizing value. One interesting feature is the appendix in which he briefly reviews the part played by different areas of the cortex in speech including the major and minor hemispheres. There is also a proposed new nomenclature in which the new term is defined, the corresponding old terminology, and its localizing value if any, is given. It is an improvement on the first edition and for anybody interested in aphasia should be of great interest and value.

BOOKS RECEIVED

Accidentes Vasculares de los Miembros F Martorell, Jefe de la Seccion de Cirugia Vascular de Instituto Politecnico de Barcelona. 350 pp, illust Salvat Editores, S A Barcelona Buenos Aires, 1945.

Analecta Psychiatrica J R Whitwell, Hon Librarian, Royal Medical Psychological Association. 160 pp 16s H K Lewis & Co Ltd, London, 1946.

Autooxidation of Diethyl Ether and its Inhibition by Diphenylamine Gunnar Lundgren. 190 pp, illust Stockholm, 1946.

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The normal salary scale is from £600 to between £1,000 and £1,150 or in Canadian currency \$2,400 to between \$4,000 and \$4,600 approximately. There are large numbers of super-scale posts to which promotion is made on merit and which carry higher salaries. The large majority of Colonial governments have agreed to allow credit for war service in fixing the point at which selected candidates will enter the salary scale. The intention of this concession is to meet the cases of candidates who, by reason of war service, enter the Colonial Service at a later age than is normal. All officers appointed to permanent posts in the Colonial Service between the outbreak of war and a post-war date to be fixed by the Secretary of State for the Colonies will be regarded as having entered the Service in a single group, and seniority is between them in an individual Colony will be reckoned by age. Government quarters in most cases free of rent and first class passages to and from the Colonies are provided and an adequate pensions scheme is in force.

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The various Government Medical Departments employ about 700 European Medical Officers including some 30 women, and about 1,200 locally appointed Medical Officers. Depending upon the territory such diseases as malaria, leprosy, sleeping sickness, plague, yellow fever, cholera and other diseases associated with the tropics are encountered in addition to the usual diseases experienced in any medical practice. An Officer in the Colonial Medical Service has special opportunities in the practice of his profession in preventive medicine; there are also opportunities for teaching and research. The medical and health services will be considerably expanded in order to fulfil the schemes for public health development already planned.

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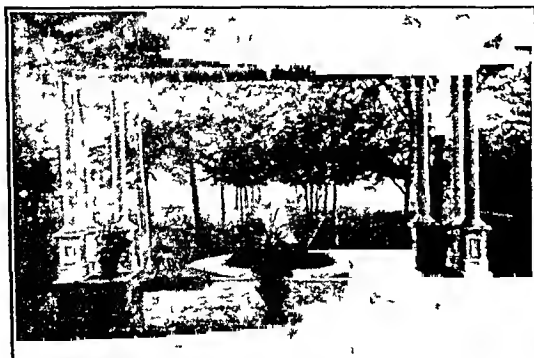
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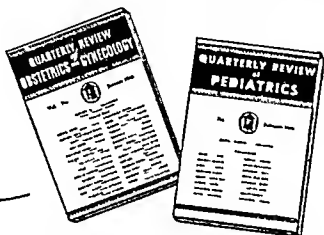
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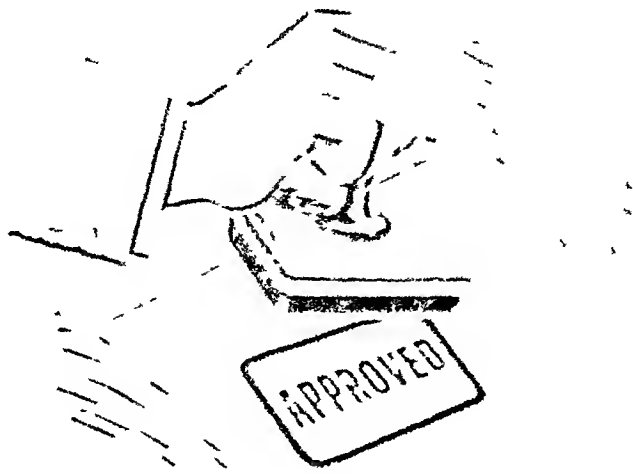
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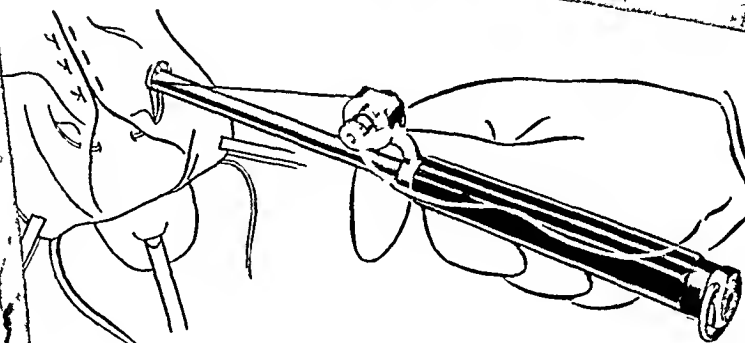


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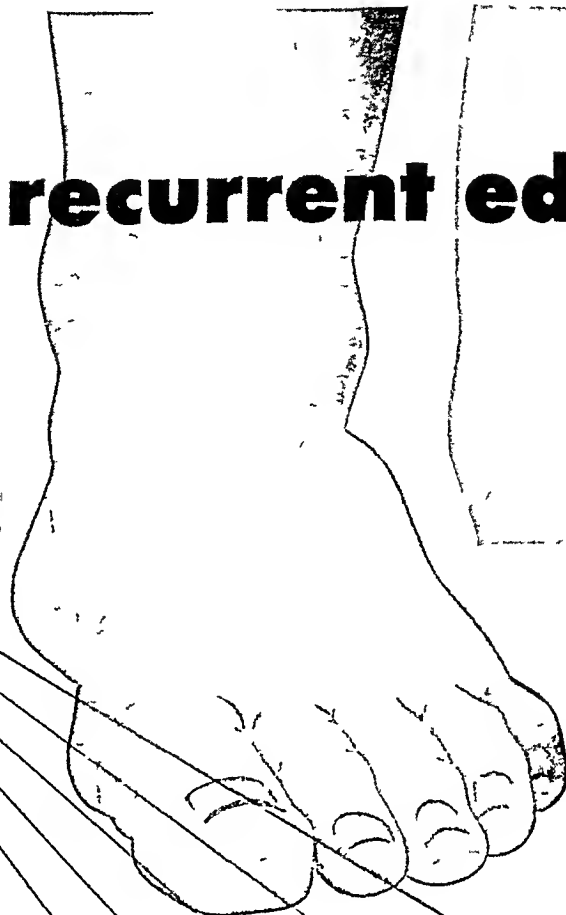
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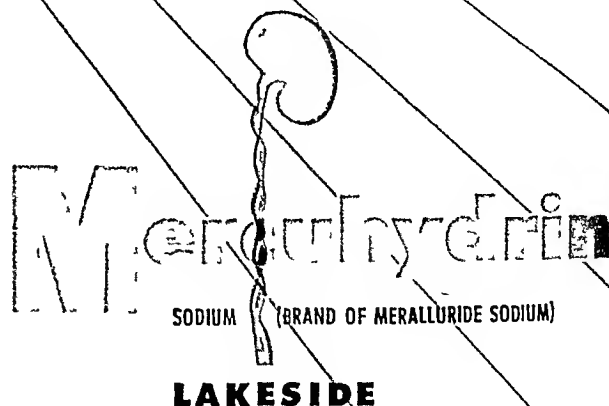
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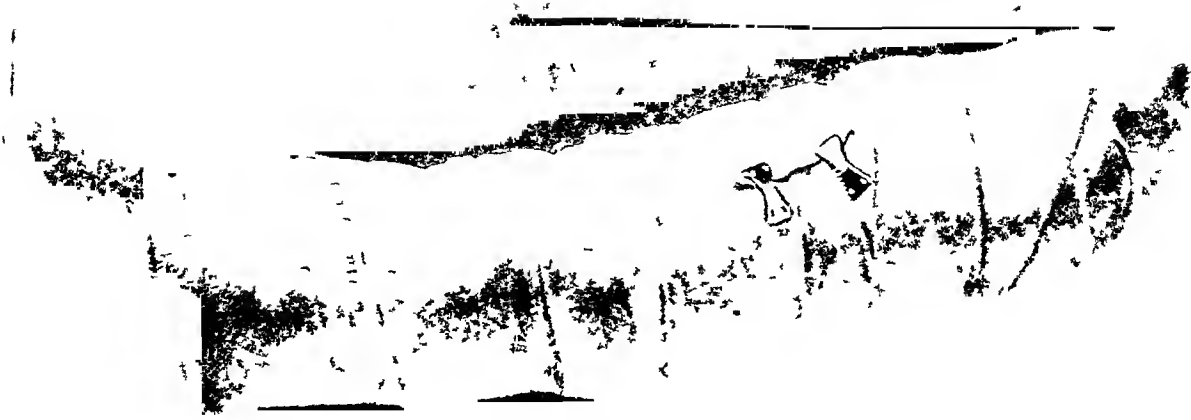
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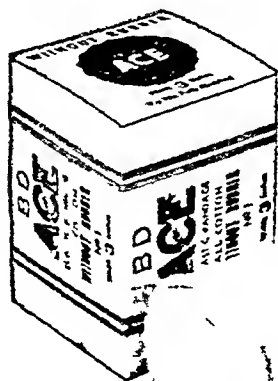
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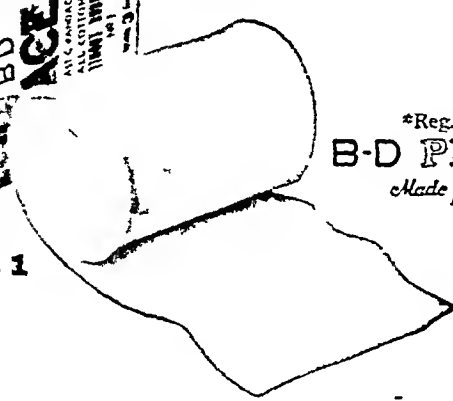
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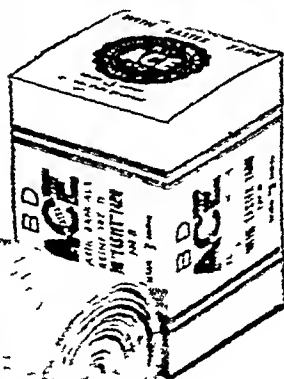
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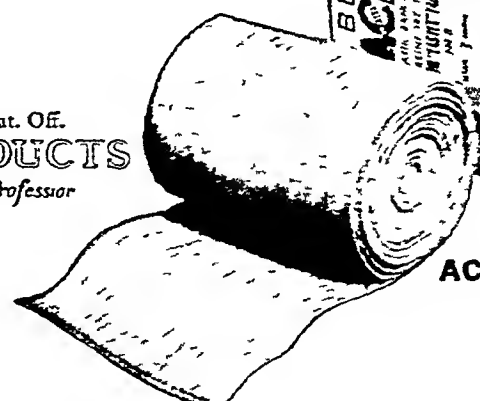
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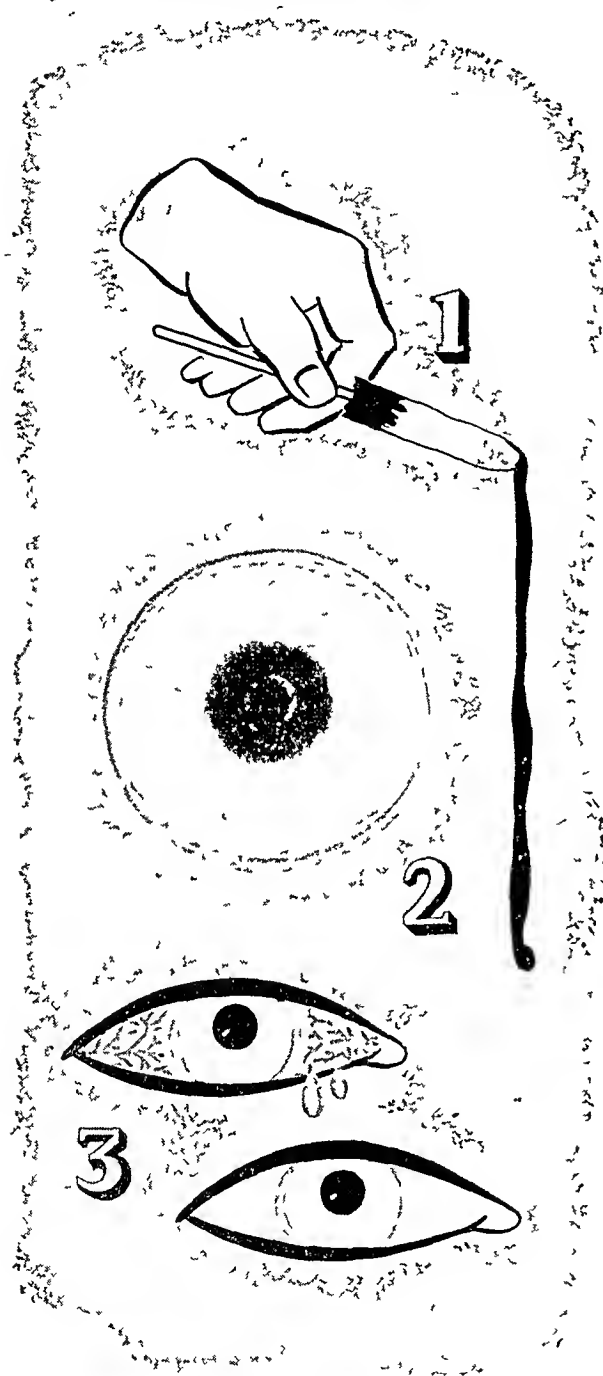


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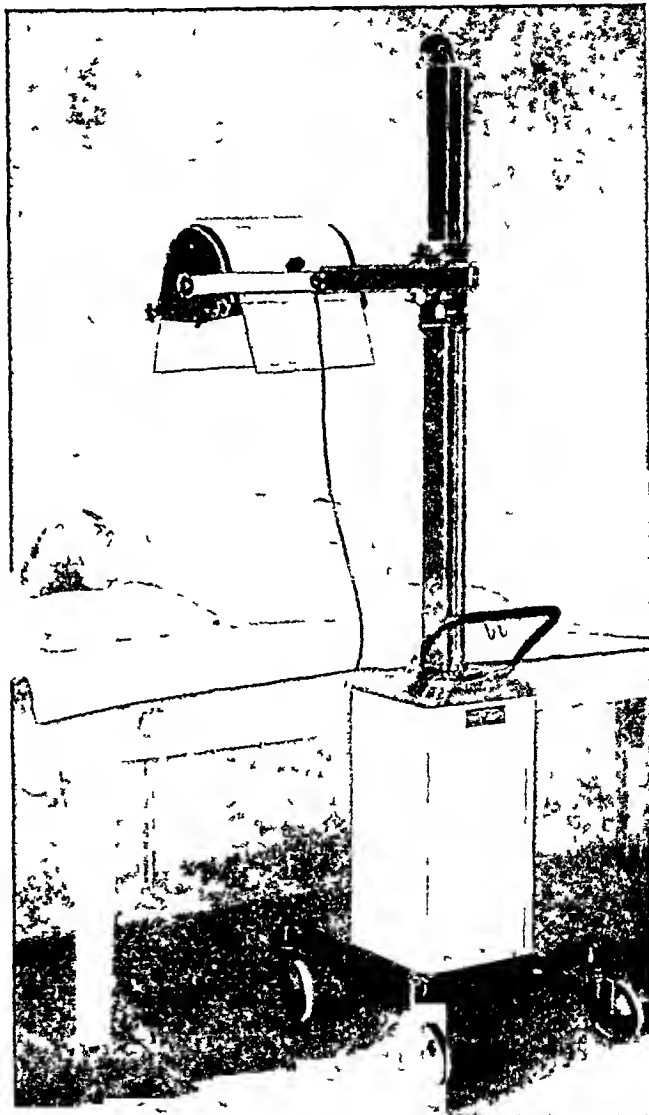
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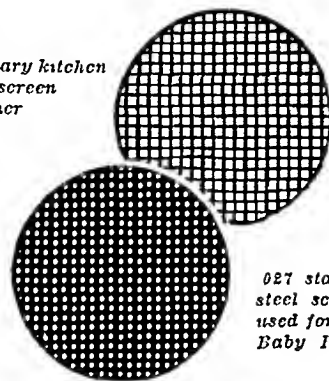
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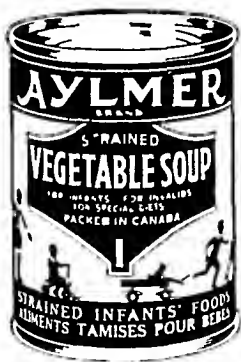
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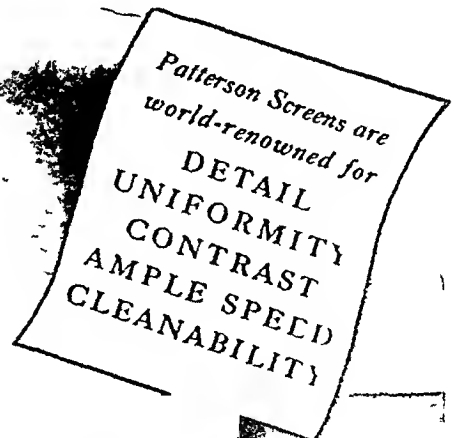
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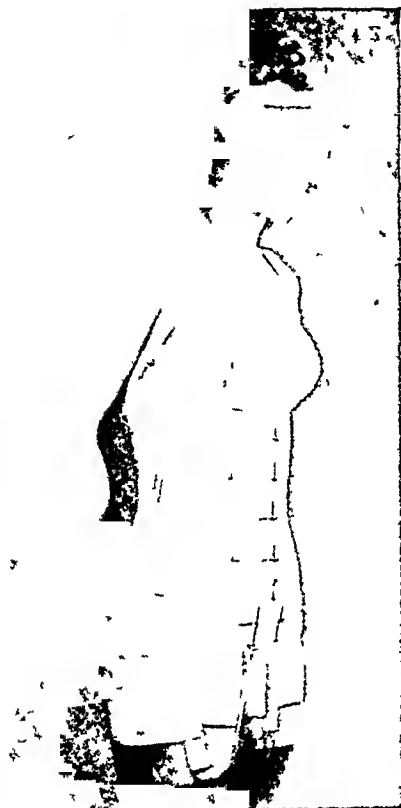
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because physicians today are so well agreed on many fundamentals of modern baby care
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insist that a *laxative* for infants and young children should be mild effective pleasant-tasting not habit forming not griping not harsh or upsetting

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The pharmacological advantages of senna are well known to the medical profession

Senna acts by stimulating peristalsis in the lower bowel
senna does not upset normal activity of the stomach and small intestine
senna does not disturb appetite or digestion, or cause nausea
senna helps re-educate the child's bowel functioning

in regulated dosages, senna induces easy elimination, seldom causes irritation or constipation after use
senna does not draw water from the tissues
senna does not lose its efficacy with repeated use so massive doses are not necessary in protracted treatment

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The makers of Castoria recognize that senna in its *natural state* has the disadvantage of a tendency to produce griping Studies have established that this is caused by resins in the senna leaf
In Castoria a special process has been developed for

extracting the active principles of senna leaves *without the resinous materials* and without impairing the laxative efficiency The active laxative ingredient of Castoria is this *specially treated senna*, from which the griping resins have been eliminated

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SANDO 3 BELLadonna Products

NEUROSES,

autonomic imbalances and related somatic disorders predominate in the clinical states confronting the physician in present day medical practice. These conditions may show a wide symptomatology, but common manifestations are insomnia, anxiety, nervous irritability, spasm pain and hypersecretion. Their proper therapy demands the correction of the underlying cause together with careful medication for the sedation of all phases of nervous excitation.

The following three Sandoz preparations, each of which exerts a characteristic degree of sedation, permit the selection of the most suitable drug for the case at hand.

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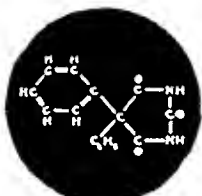
As effective as atropine
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Vagus Sedative.

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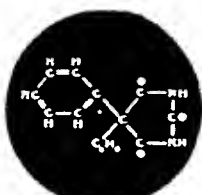
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Action: A sedative of the entire neurovegetative system.

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the standard form of iron therapy
for the iron-deficiency anemias
of infancy and childhood



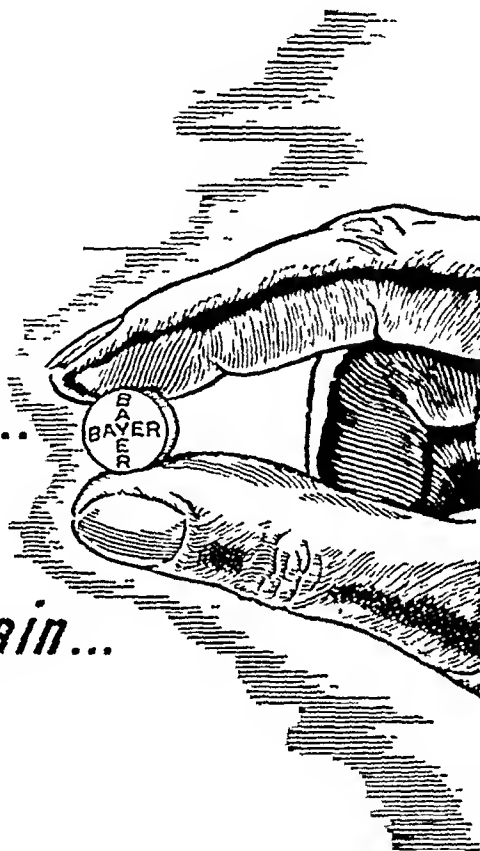
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LACTOGEN + WATER = FORMULA

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2 OUNCES

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40 CALORIES
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20 CALORIES
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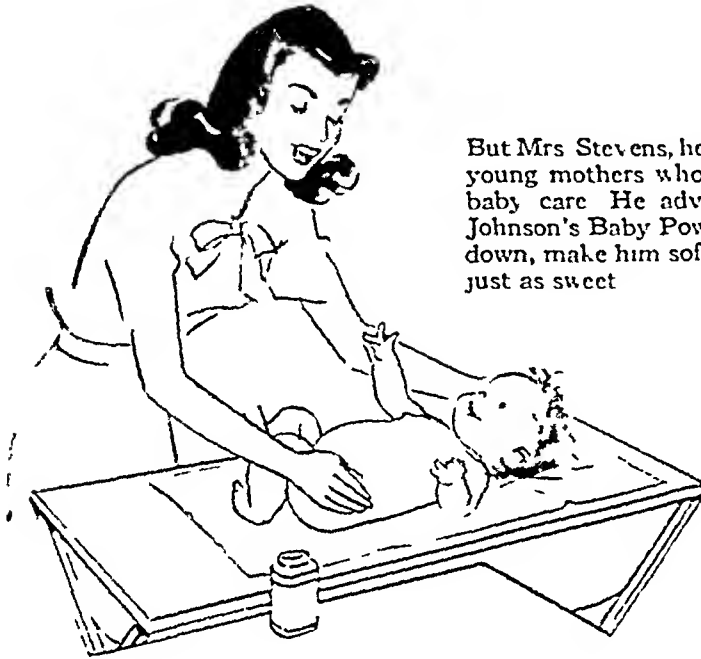
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"Doctor - my baby is anti-social!"

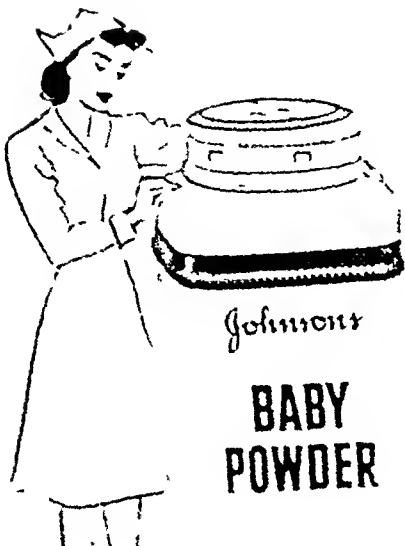
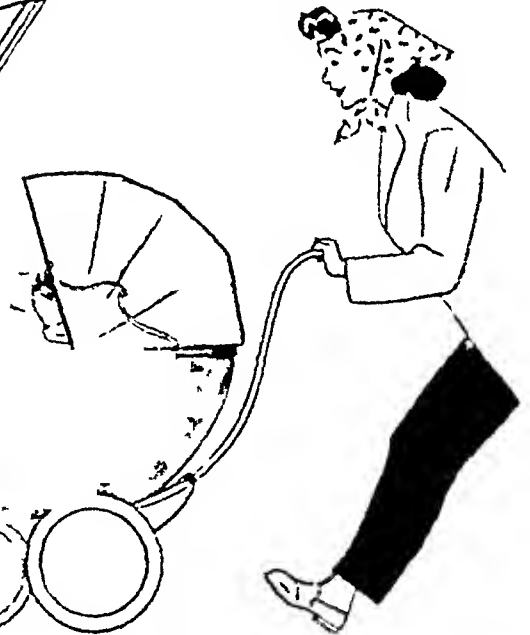
"He screams at my sisters and my cousins and my aunts! He screams *all* the time!" bleats young Mrs Stevens

Her harried doctor assures her that Baby Stevens could be the friendliest sunniest baby in town if proper attention is paid to his tender skin. Baby Stevens is in a constant state of rashes, chafes, and prickles - no wonder beams turn to screams!



But Mrs Stevens, her doctor knows, is just one of many young mothers who need specific guidance in proper baby care. He advises such young mothers to use Johnson's Baby Powder every day - to smooth baby down, make him soft as the proverbial rose-petal, and just as sweet.

Johnson's Baby Powder is pure - made of the very best talc obtainable, and boric acid powder - sure to agree with baby's skin. It's the choice of more doctors and nurses, than all other brands combined.

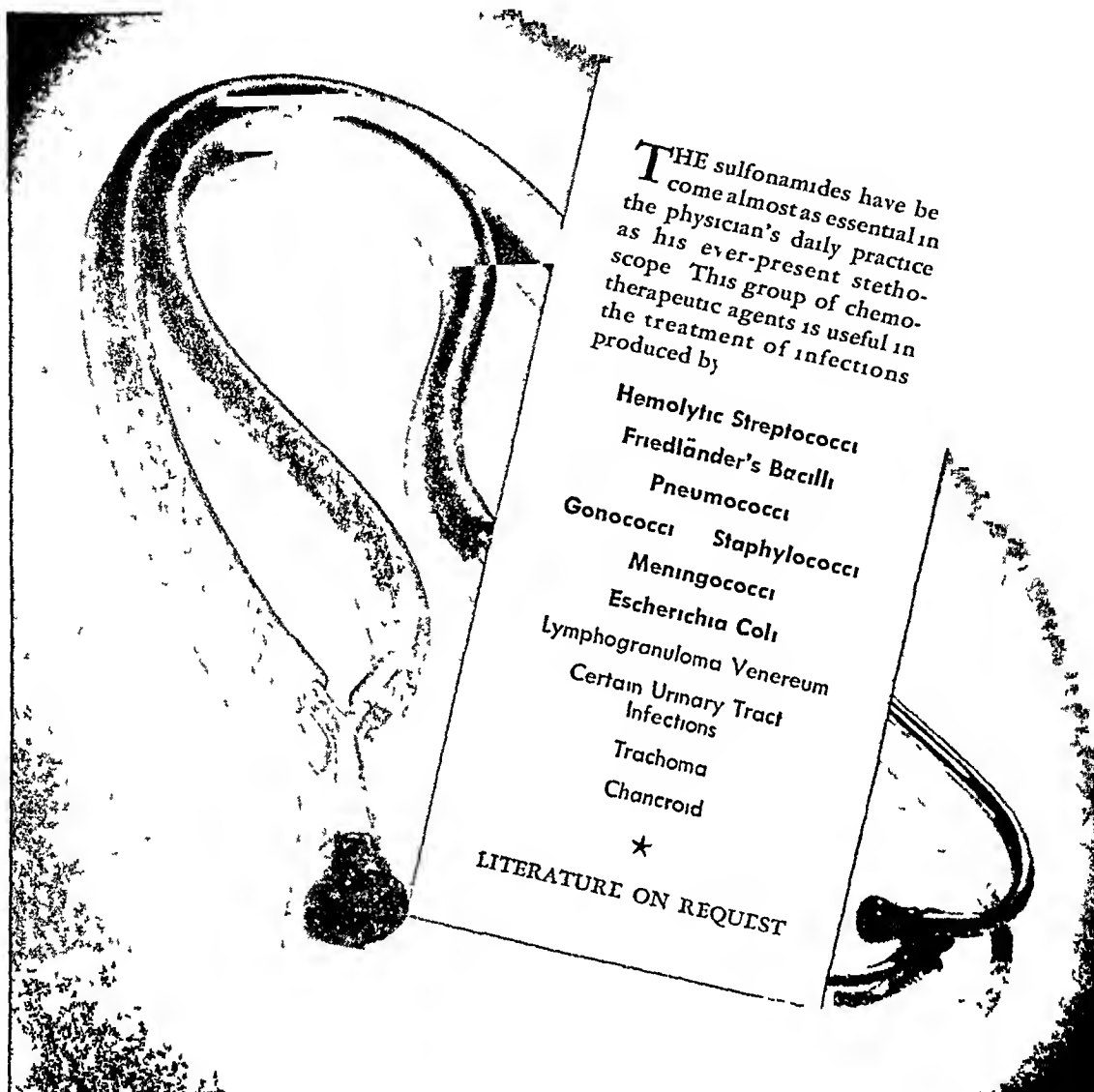


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Johnson's Baby Powder

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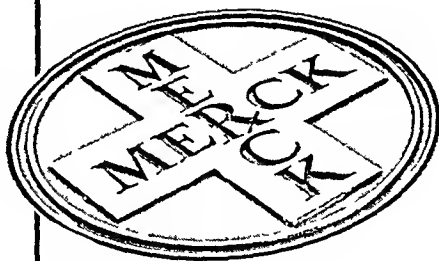
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Homogenization helps forestall infant nutritional anemia



That the availability and utilization of iron in Libby's strained and Homogenized Baby Foods is considerably greater than that of baby foods which are merely strained has been conclusively proved by laboratory and clinical studies. Libby's dual processing—first straining, then Homogenizing—releases the cell contained iron and disperses it homogeneously throughout the food, thus providing a greater yield of this essential nutrient. The fine textured bulk resulting from Libby's Homogenization process presents a greater surface area to the action of the digestive juices. These advantages are particularly valuable in the aim to forestall nutritional anemia in the infant. They make possible supplementation of the milk diet as early as in the sixth week—before pre-natal stores are exhausted. This is only possible with Libby's Baby Foods because only Libby's Baby Foods are Homogenized.

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Vegetable Beef Soup
Vegetable Soup
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Libby's Homogenized
Evaporated Milk

LIBBY'S PROCESS OF HOMOGENIZATION

- 1 Opens cell capsules, releases contained nutriment, and disperses it homogeneously throughout
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- 3 Exposes the nutriment to the digestive juices in a considerably increased surface area, thus facilitating digestion
- 4 Increases availability of the contained nutrients thus facilitating utilization
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Libby's
HOMOGENIZED
(EXTRACELLULAR)

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Lederle Laboratories Division, American Cyanamid Company recently announced that V₁ Delta, Vitamin A and D, will be available in a new type capsule in packages of 100 and 1,000 with a potency of A-5,000 U, D-5,000 U

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The Canadian Medical Protective Association

PRESIDENT - JOHN F. ARGUE, M.D.

A mutual medical defence union founded in 1901 Incorporated by act of Dominion Parliament, February 1913, and affiliated with the Canadian Medical Association 1924

OBJECTS To assist in the defence of its members in cases of alleged malpractice, and to encourage honourable practice in the daily work of the medical profession

Subject to our by-laws assistance is given by the payment of the taxable costs of actions together with reasonable counsel and witness fees in cases undertaken by our Association, as well as damages if awarded. All members in good standing of the Canadian and various Provincial Medical Associations may be enrolled upon signing the application form and paying the annual fee. All other regularly qualified practitioners must have their application countersigned by two members of our Association.

Address All Correspondence to the Secretary-Treasurer,
Suite 401, 180 Metcalfe St., Ottawa, Canada.

APPLICATION FOR MEMBERSHIP

I, _____ aged _____, a
Print name in full
qualified practitioner of the Regular School of Medicine hereby apply to be enrolled as a member of the Canadian Medical Protective Association

I am a graduate of _____ University
in the year _____, and a duly licensed practitioner
of the Province of _____. I am also
a member in good standing of _____
Medical Association *Canadian or Provincial*

Signature _____

Address _____

Recommended by two members of the Association, unless applicant is a member in good standing of the Canadian or any Provincial Medical Association

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The annual fee is five dollars per calendar year, half rates after July 1st (Payable at par, Ottawa)



LIVER EXTRACT INJECTABLE 15 UNITS PER C.C.

The exceptionally high anti-anæmic potency of Anohæmin B.D.H. is sometimes not realised by physicians who therefore tend to administer unnecessarily large doses or to administer Anohæmin at unnecessarily short intervals. In consequence a proportion of the material is wasted and the cost of treatment becomes excessive. Further the patient is subjected to the administration of larger or more frequent injections than are required for effective treatment. It is important to realise therefore that even moderately severe cases of pernicious anæmia usually require an initial dose of not more than 2 c.c. followed by 1 c.c. every seven to ten days until the blood count is normal. Doses of 1 c.c. to 2 c.c. monthly provide adequate maintenance in most cases.

Available in

1 c.c. ampoules • 15 c.c. vials • 2 c.c. ampoules

THE BRITISH DRUG HOUSES (CANADA) LIMITED

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The Vitamin D Potency of Carnation Evaporated Milk has been increased to

400 International Units

PER RECONVERTED QUART

THIS increased potency (over the 162 International units supplied formerly) now assures a *margin of safety* for the prevention of rickets in normal infants and children, and provides for good bone and tooth development and excellent growth

This higher irradiation means that now Carnation Milk provides 20 International units of Vitamin D per Imperial Fluid

ounce—or 400 units per reconverted quart (half Carnation, half water)

The announcement of this important change is timed to coincide with the completion of arrangements that make 400-unit Carnation Milk available now, or very soon in all parts of Canada

Carnation Company Limited, Toronto 1, Ontario

Carnation



"FROM CONTENTED COWS"



Milk

A Canadian Product

"Go to the Potter,"

the Hindus advised



And if, in 19th century India, you had a fractured extremity, you went! For the potter would immobilize the limb in a mold of clay which served as a crude cast.

Times have changed since Ballingall* reported this practice. The qualities which make today's casts efficient are best shown in Curity Osteic Plaster Bandages, Splints and Deodorizing Bandages. With the Osteic Plaster Line, casts are stronger and more comfortable, and more positive immobilization is possible.

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For you, these advantages mean savings in time and materials, better casts. For quality, speed and economy, choose Curity Osteic Plaster Bandages, Splints and Deodorizing Bandages.

*Ballingall, Sir George. *Outlines of Military Surgery*. Edinburgh: 1872, p. 89.

CURITY OSTIC PLASTER LINE

Bandages - Splints - Deodorizing Bandages

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RESEARCH TO IMPROVE TECHNIC...TO REDUCE COST

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In Eczema A CLEANER APPROACH PERMITTING OF Continuous Therapy

WHILE tar has been long employed in the treatment of eczema, the drawbacks attending its use were usually more annoying than the disease itself. Unsightly, soiling to skin and clothing, and of unpleasant odor, crude tar with its objectionable features discouraged patient cooperation and frequently defeated the aims of therapy. With Tarbonis, tar therapy assumes a new high in efficacy and cosmetic appeal. Odorless, colorless, entirely free of staining properties, Tarbonis retains all the therapeutic properties of tar. Its use in eczema, including the atopic and infantile forms, is followed by prompt relief of subjective discomfort, and by rapid resolution of the lesion itself. Thus *effective* therapy may be instituted, application every few hours becomes a practical possibility, since following its application, it "vanishes" from the skin, leaving its active ingredients in intimate contact with the lesion, thus avoiding soiled clothing and bed linen.

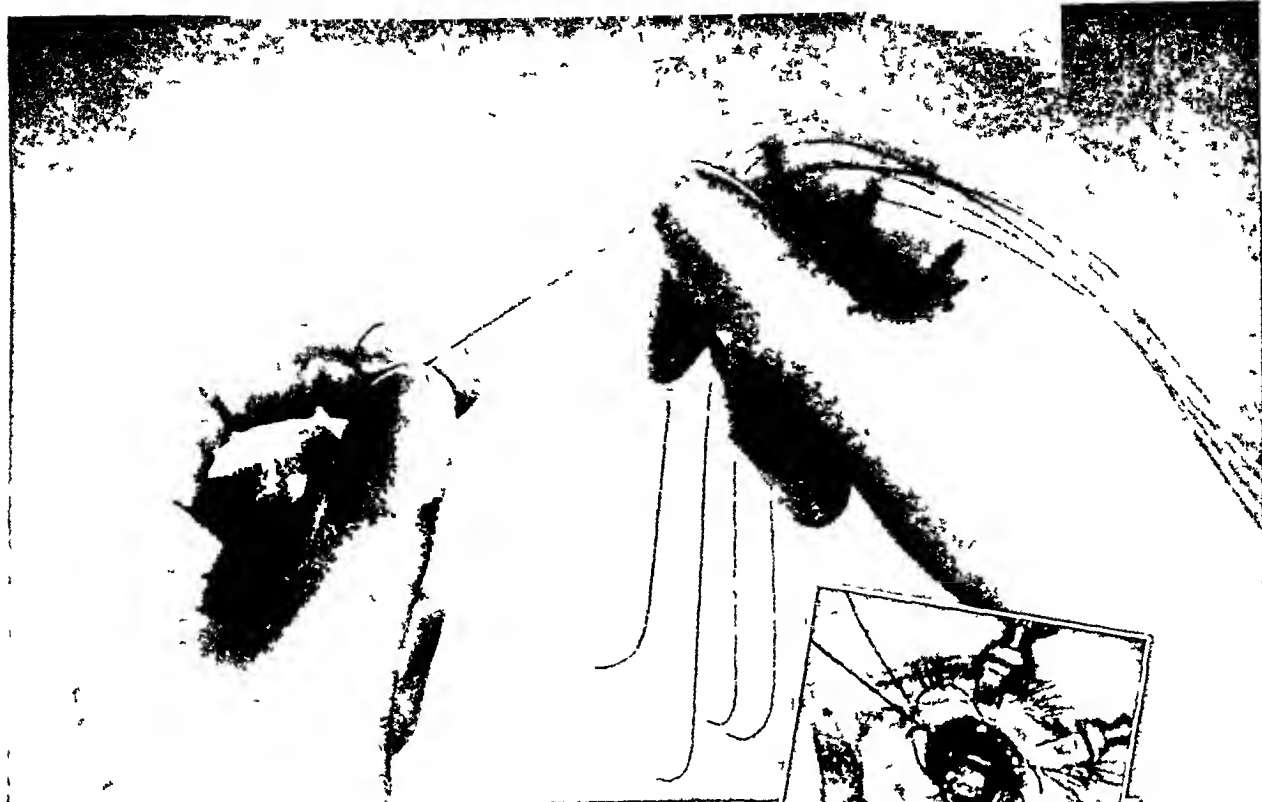
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Tarbonis is a product of The Tarbonis Company and is distributed in Canada exclusively by Fisher & Burpe, Ltd., Winnipeg, Man. Literature will be sent on request.

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PENICILLIN**SYMPTOMATIC TREATMENT****SULFONAMIDES****LARYNGOBIS**

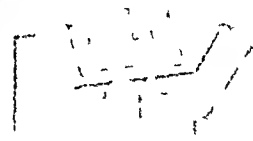
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1 Hospital Days, *J Am M Ass*, 131 1050, 19462 Duration of Illness, Silber, *J Pediat*, 25 3, 1944

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LARYNGOBIS**RECTAL SUPPOSITORIES**

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Boxes of 2 and 12 suppositories

Two Dosage forms adjusted according to age Adult and Child

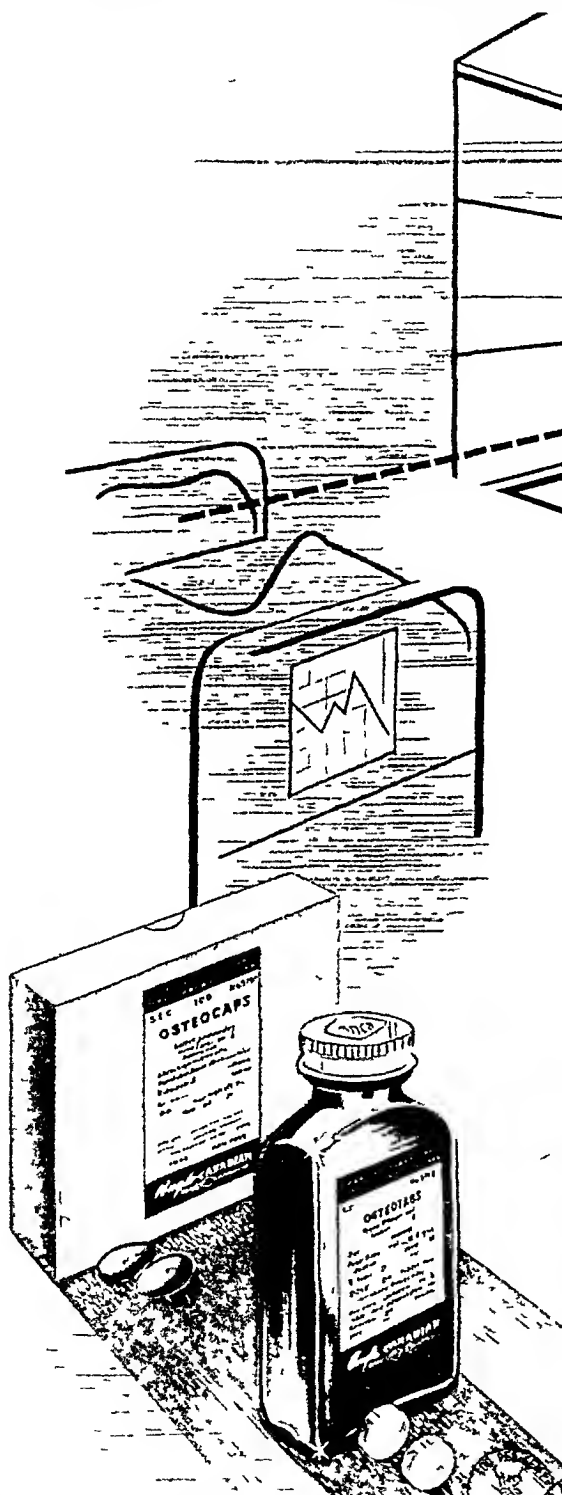
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Report on the Clinical Use of Bone Meal...

"a six year old child with a grave defect in his dentition and complaining bitterly of pains in his legs was given a brand of decalcium phosphate with vitamin D in ten grain doses twice a day. There was no weight gain and much restlessness. The little chamber he used at night was becoming encrusted with calcium deposit. He was getting very little absorption of the calcium.

"It occurred to us that if we gave bone meal to calves and young animals why shouldn't nature's own combination of bone minerals be completely utilized by any animal body? We sifted and pulverized available bone meal and filled 10 grain capsules. In one week the child was playing as hard as any of his school-mates. There was no more excess calcium deposit, although he was getting three 10 grain capsules daily. He made steady progress in the three years in which we had him under observation and his secondary growth teeth were sound."

See article reprinted in Canadian Medical Journal,
June 1944, Vol 50 (E. M. Martin, M.D.)

Each Osteocap and Osteotab contains purified select bone flour $7\frac{1}{2}$ grains, vitamin A (1000 I.U.) and vitamin D (500 I.U.)

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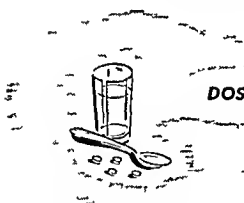


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is generally accepted by the medical profession
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As a laxative—it is gentle, smooth-acting with-
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As an antacid—affordseffective relief Contains
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Caution Use only as directed

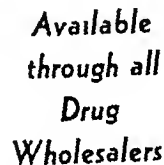
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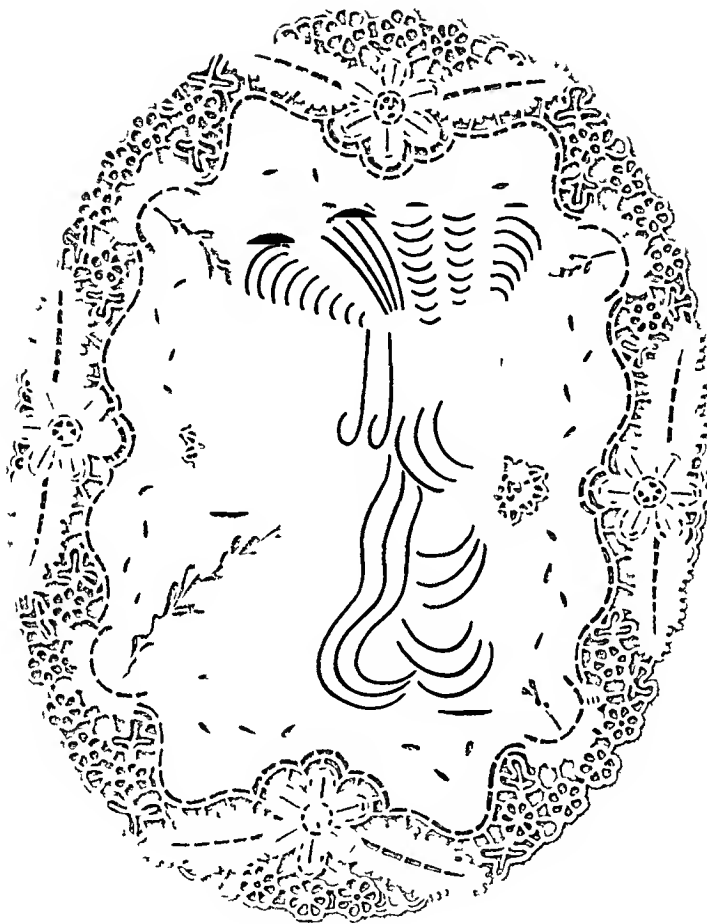
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**NATURAL Conjugated Estrogenic Substances
FOR ORAL USE**

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HOW TO GIVE PATIENTS NATURAL SUPPORT...

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Ordinary corsets, purchased and fitted in the usual way, are designed on the *constriction* principle. The shaping in these garments is developed *downward*. They are held in place by tightness at the waist and pull on the hose supporters. Whether a woman wears her corset for an unusual physical condition or for a simple problem of excess flesh or poor posture, her problem is only increased by the constriction principle. The effect of this tightness at the waist and constriction principle of design can be demonstrated by placing the hands on the abdomen and pressing down



Effect of Constricting Corsets

Natural Support...

On the other hand, there is the new and entirely different Spirella principle. Spirella is designed on the *Natural* principle of support. Beginning at the pubic bone and following the groin line, the garment encircles the pelvis, anchoring it under the abdomen and buttocks. From this base, the shaping is developed to afford support to the figure upward and backward in harmony with muscular action. The effect of Spirella's *Natural* principle of support can be demonstrated if the patient places her hands low on her abdomen and lifts, as in the second picture.



Natural Supporting Action of Spirella

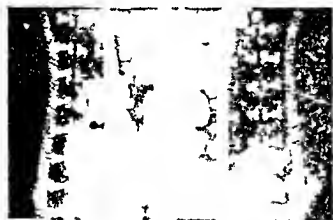
Individually Made...

Spirella Garments are never hurried in stock. Each garment is individually made to the measurements of each patient's figure *after it is correctly supported*. This is the way it's done. The Spirella Corsetiere brings with her the Patented and Exclusive Spirella Modeling Garments. By adjusting them to the patient, she obtains exactly the same effect as she will receive from her own Spirella. (If the doctor desires, he can even check this adjustment in the fluoroscope.)

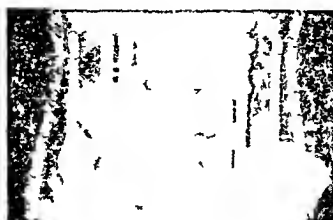


Corsetiere Measures SUPPORTED Figure

Because Spirella is designed anatomically and for each customer, the lines of traction are located correctly to give just the degree of support required, without the use of clumsy belts or buckles. Thus Spirella is comfortable and attractive to wear. The doctor, therefore, can be confident that his instruction is being followed. For complete information about Spirella Garments, call a local Corsetiere or write the Spirella Company of Canada, Ltd., Niagara Falls, Ontario.



X-Ray Evidence that the patient gets just the same natural support from her Spirella as she does from the Modeling Garment, whose adjustment was checked by the physician. These X-Rays were taken under competent medical supervision. With the Spirella Modeling Garment adjusted (see left-hand X-Ray) the hepatic flexure lies $3\frac{1}{2}$ " above the iliac crest. The right-



hand X-Ray shows the same woman in her individually designed Spirella. The hepatic flexure now lies $3\frac{1}{2}$ " above the iliac crest. Thus, by suggesting Spirella garments, you can be sure of getting just the degree of support you want. In addition you can be sure that the patient will get exactly the same support in her finished garment.

WOMEN FEEL BETTER
AND LOOK BETTER IN

Spirella
INDIVIDUALLY DESIGNED
HEALTH SUPPORTS

LIPIODOL LAFAY

THE RADIOLOGIST EXTENDS THE SCOPE OF HIS DIAGNOSTIC SKILL



Lipiodol (Lafay) discloses an abscess of the lung

INDICATIONS

LIPIODOL (Lafay) — the original French iodized oil — may be advantageously used in the roentgenographic exploration of the following systems, with of course proper consideration of suitable technique and contraindications in each case

- 1 Broncho pulmonary apparatus
- 2 Uterus and Fallopian tubes
- 3 Paranasal sinuses.
- 4 Bladder, urethra, and seminal vesicles
- 5 Lacrimal ducts
- 6 Fistulae and abscess cavities

By the use of a suitable opaque medium, conditions previously obscure may now be accurately visualized. The introduction of LIPIODOL (Lafay) for radiologic exploration has added considerably to the scope of the radiologist. It makes possible radiologic examination of various body cavities and organs which otherwise are not practically amenable to such examination. It facilitates more accurate diagnosis and therefore more efficient treatment.

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Sole agents for Canada



PIPÉRAZINE EFFERVESCENTE MIDY

(Effervescent granules)

TYPICAL ANTI-URIC



THIODÉRAZINE MIDY

(injectable)

(Ampoules of 5 c c)

FOR CHRONIC RHEUMATISM



THIODÉRAZINE MIDY

(oral)

(Drops)

FOR CHRONIC RHEUMATISM



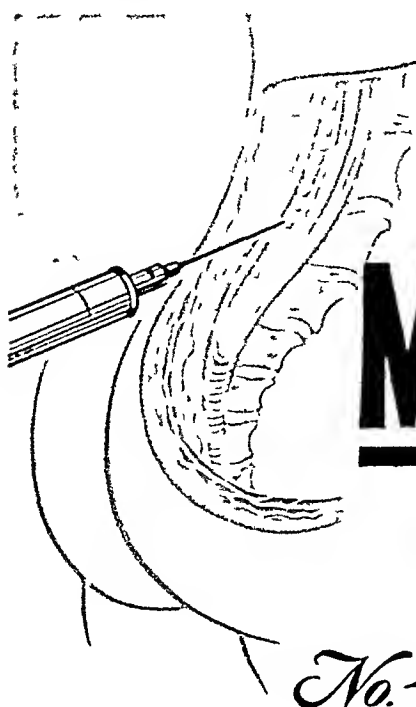
THIODACAÏNE MIDY

(Ampoules of 20 c c)

FOR RHEUMATIC PAIN

Literature and samples

VINANT Ltd, 200 rue Vallée, MONTRÉAL



Meningitis

Penicillin has a well established role in the treatment of the coccal meningitides. In the meningococcal form the response to penicillin

therapy is somewhat slower than following the administration of the sulfonamides, however, penicillin is indicated in instances of sulfonamide-resistance and when patient sulfonamide

hypersensitivity exists. In meningitis due to staphylococci, pneumococci, or streptococci, penicillin is the drug of choice.

As soon as the diagnosis is established, penicillin therapy should be instituted in doses of 20,000 to 40,000 units every two to three hours by the intramuscular route. Treatment should be thorough, and should be continued until all signs and symptoms of the infection have been absent for seven to ten days. Since penicillin administered systemically does not penetrate the subarachnoid space, intrathecal (intraspinal, intracisternal, intraventricular) administration is also required. Ten thousand units in 10 cc of isotonic solution of sodium chloride should be injected (after withdrawal of an equal volume of fluid) once or twice daily until the spinal fluid is clear, and for four days thereafter.

When concurrent sulfonamides are indicated they should be administered in a dosage sufficient to establish a blood level of 15 mg per cent.

Surgical, supportive, and other measures should be employed when indicated.

SPINK, W. W., and HALL, W. H. *Penicillin Therapy at the University of Minnesota Hospitals 1942-1944*. *Ann Int Med* 22:510 (April) 1945.

WHITE, W. L., MURPHY, F. D., LOCKWOOD, J. S., and FLIPPIN, H. F. *Penicillin in the Treatment of Pneumococcal, Meningococcal, Streptococcal and Staphylococcal Meningitis*, *Am J Med Sc* 210:1 (Jul) 1945.

IN SCHENLEY LABORATORIES CONTINUING SUMMARY OF PENICILLIN THERAPY.....

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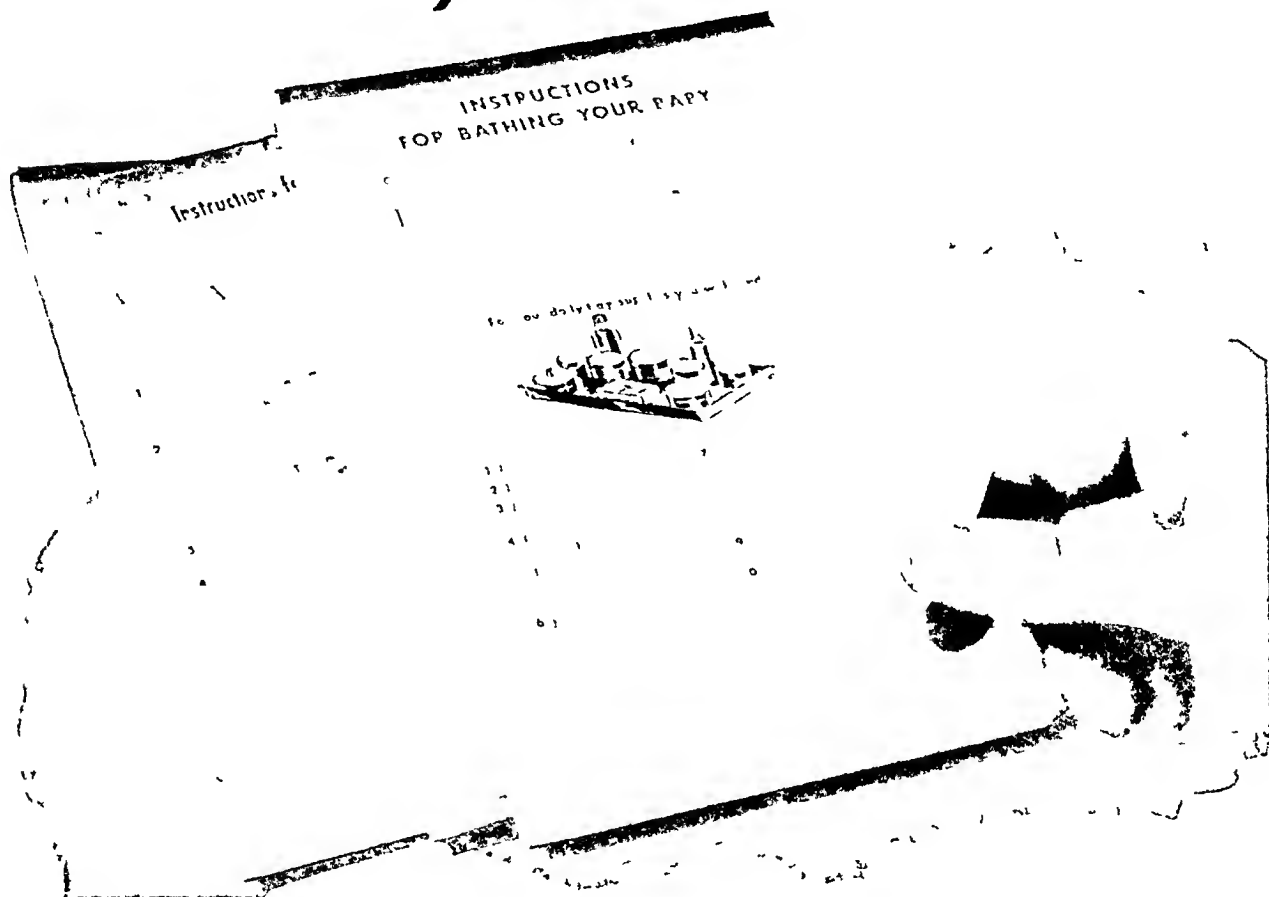
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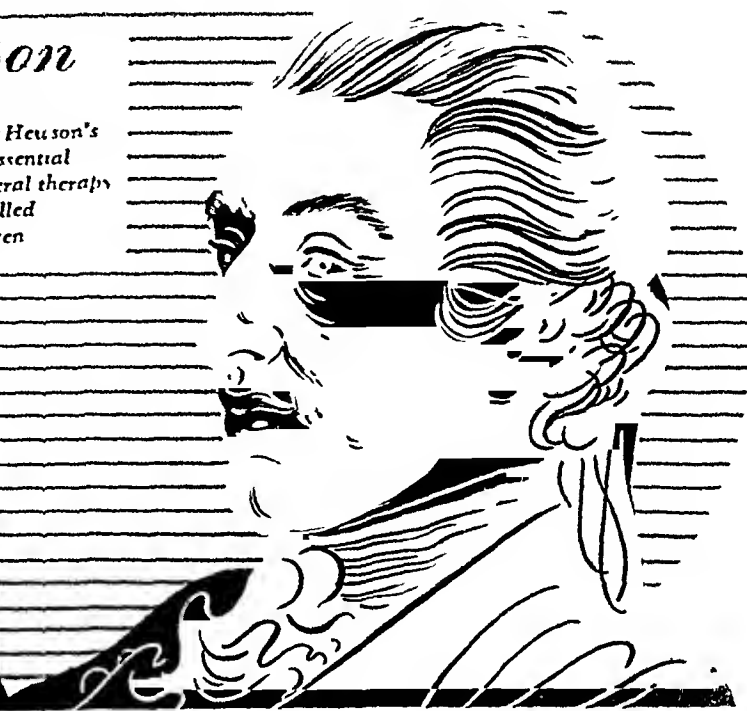
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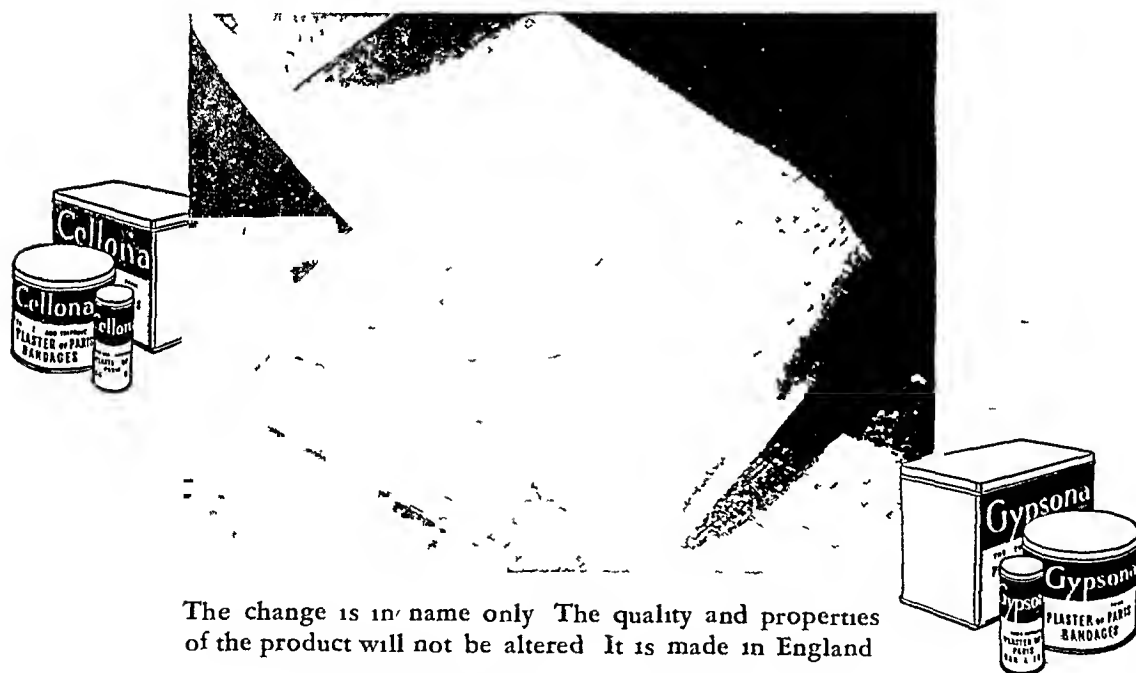
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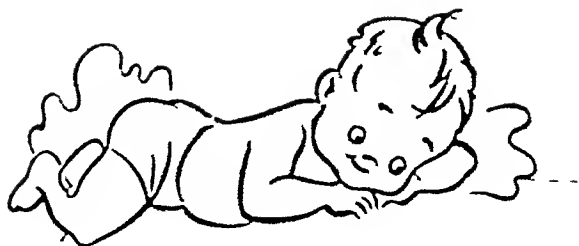
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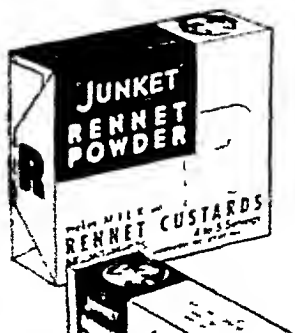
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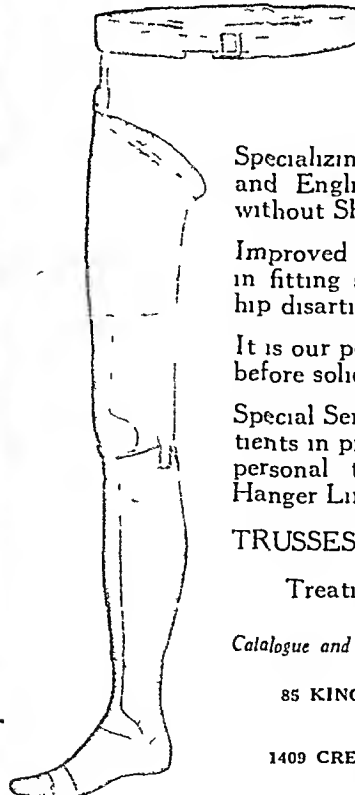
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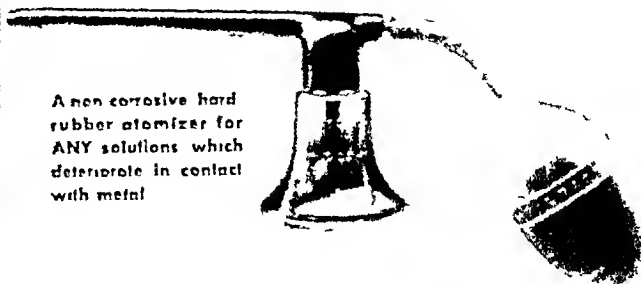
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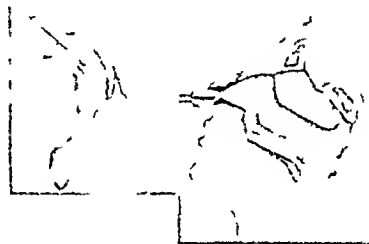
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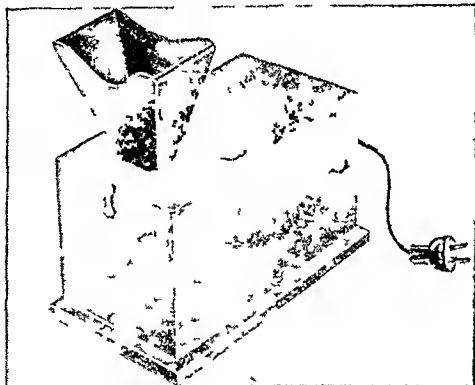
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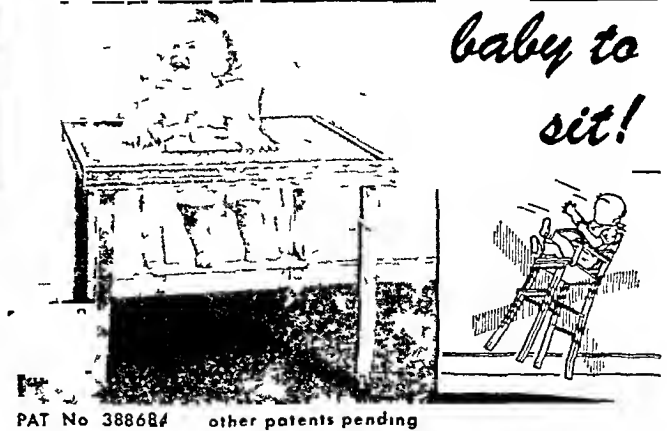
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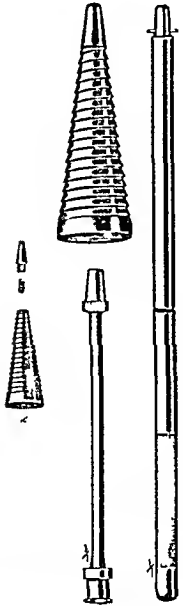
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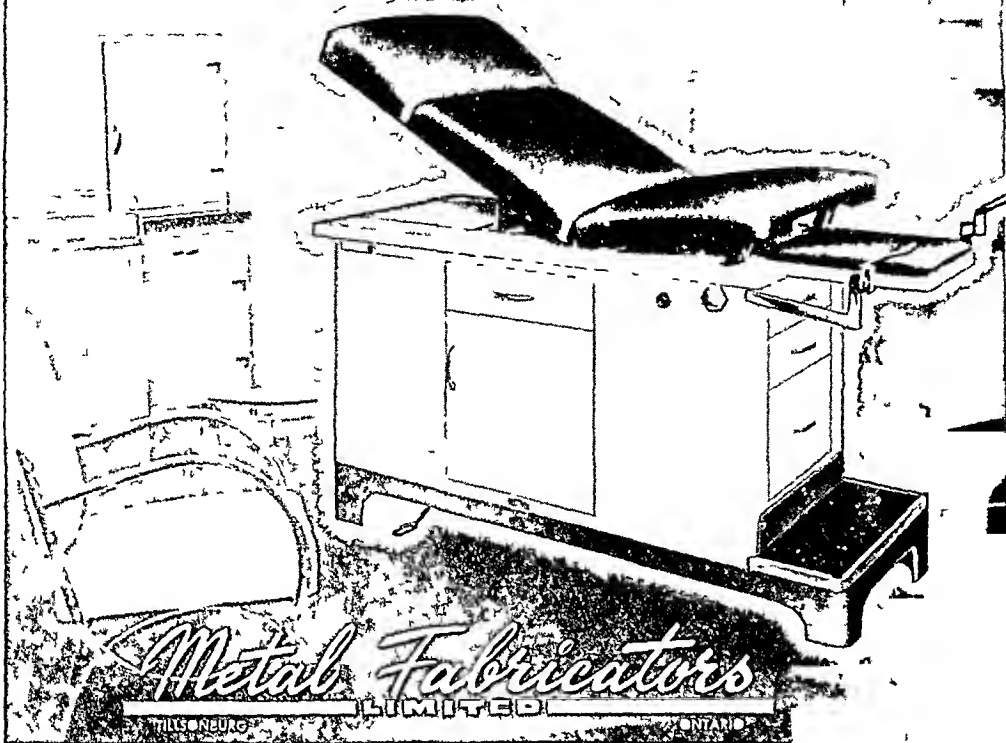
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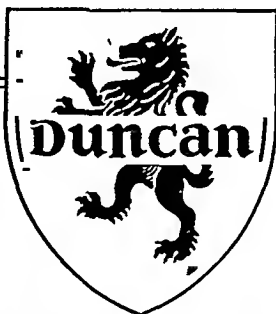
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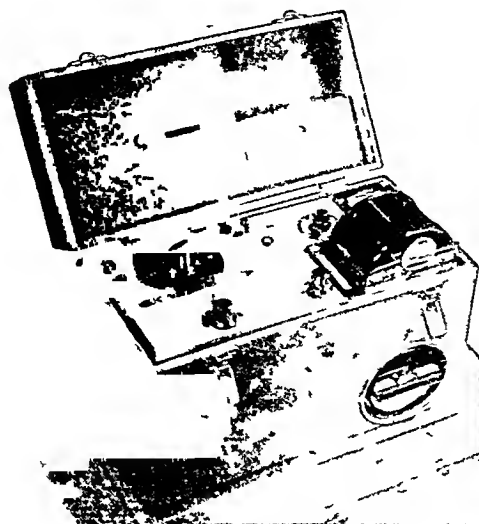
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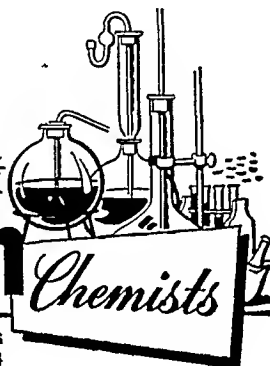
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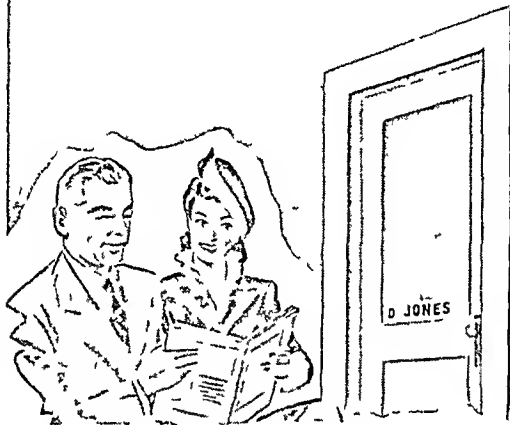
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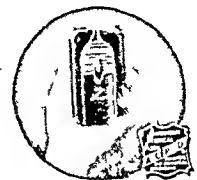
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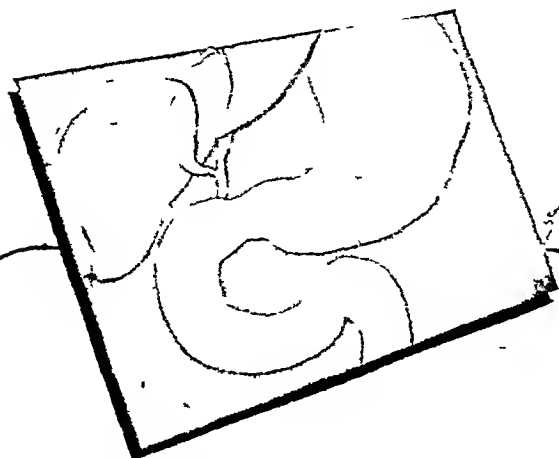
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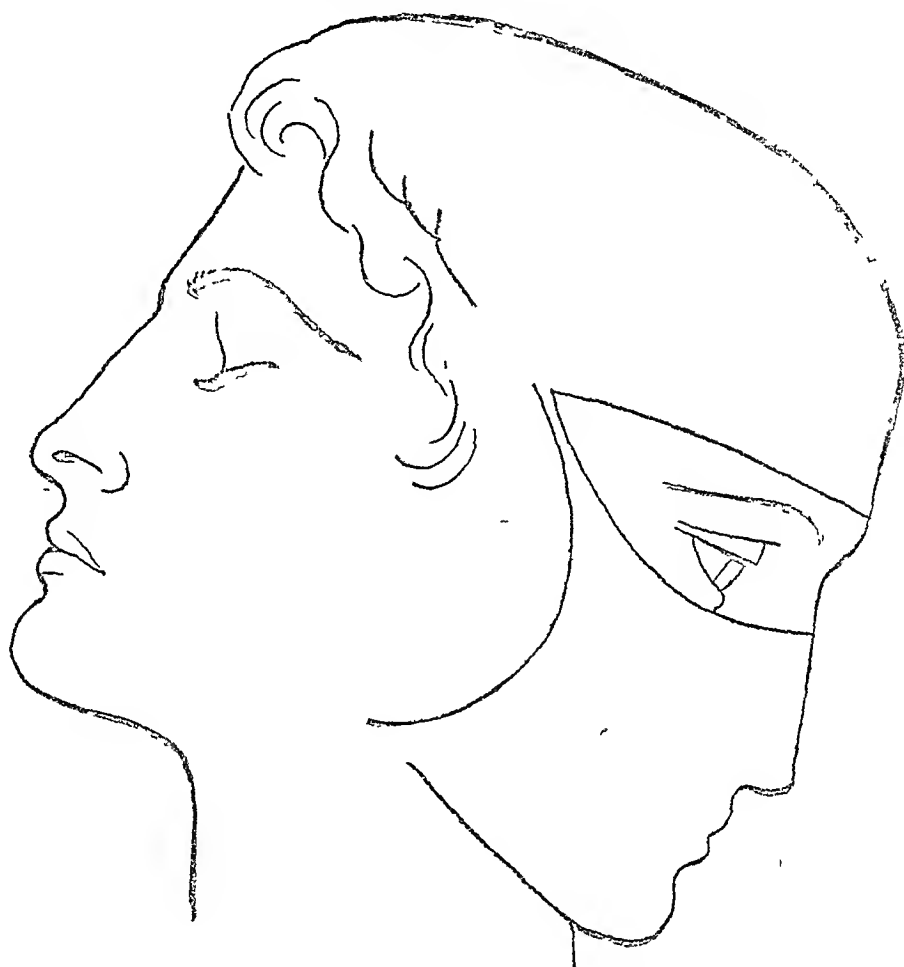


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(1) Cullen, S.C.: *Anesthesiology* 5:166 (March) 1944

(2) Griffith, H.R.: *J.A.M.A.* 127:642 (March 17) 1945

(3) Griffith, H.R.: *Canad M A J* 50:144 (Jan) 1944

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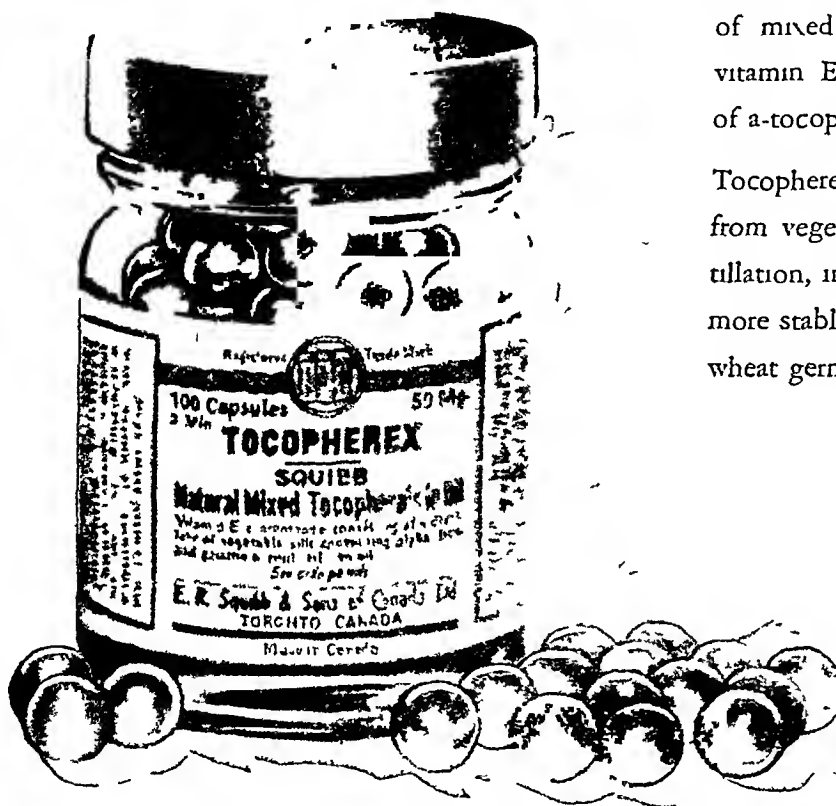
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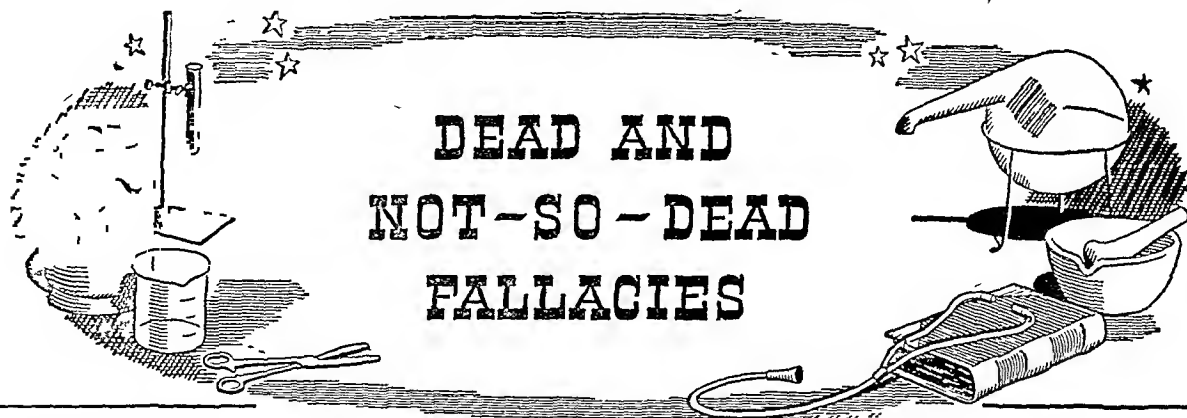
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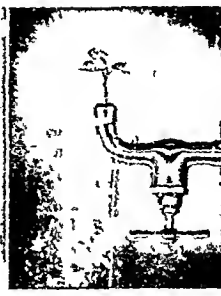
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Vol 55

1946



The illustration depicts a close-up of a person's face, specifically the eyes and nose, rendered in a high-contrast, stippled style. The eyes are closed or heavily shadowed, suggesting a state of hypnosis. The word "HYPNOTIS" is written in a bold, sans-serif font, with the letters slightly tilted and overlapping. Below the word, there is a shield-shaped logo containing a stylized design. The background is filled with numerous small dots and stars, creating a cosmic or dreamlike atmosphere. The entire illustration is framed by a thick, dark border.

HYPNOTIS

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to the human body than liquids. Hunger can be endured for days and weeks—thirst is unendurable.

And as liquids are important, so also are the organs of the body that control the balance of liquids and purify them in the system.

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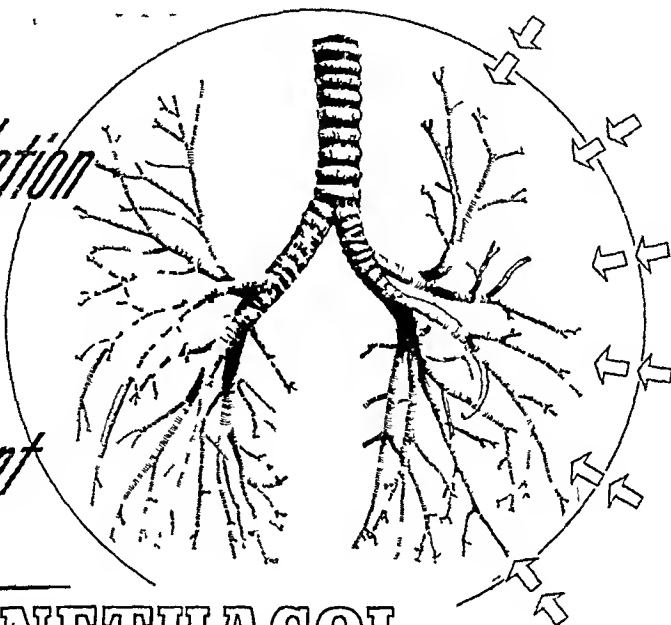
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Chloroform	1 gr
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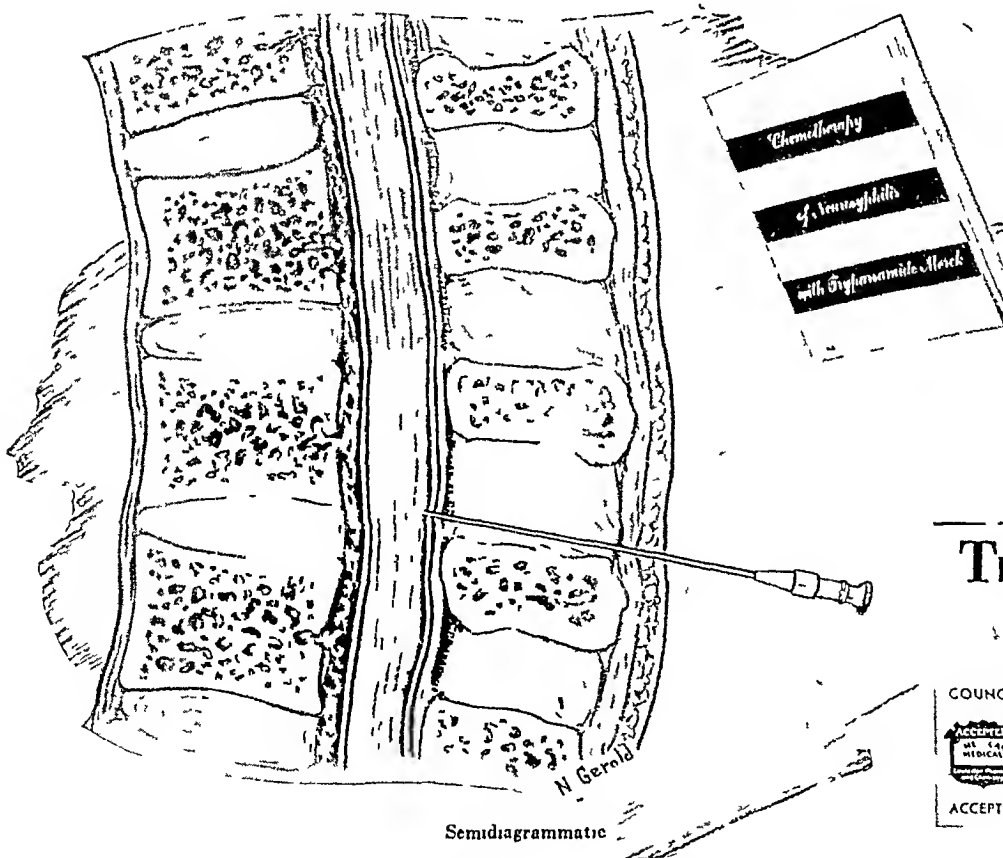
The menopause is a period of transition in a woman's life. It is a time when the body is adjusting to the changes that are taking place. It is a time when the body is becoming more aware of its own needs. It is a time when the body is becoming more sensitive to the changes that are taking place. It is a time when the body is becoming more aware of its own needs.

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Statistical studies reveal that approximately thirty per cent of syphilitic patients exhibit abnormalities in the spinal fluid during initial examinations, without displaying clinical symptoms of cerebrospinal involvement. Although adequate routine treatment of early syphilis will prevent the appearance of abnormalities in most cases, the use of Tryparsamide Merck combined with hyperthermy, is suggested in resistant cases.

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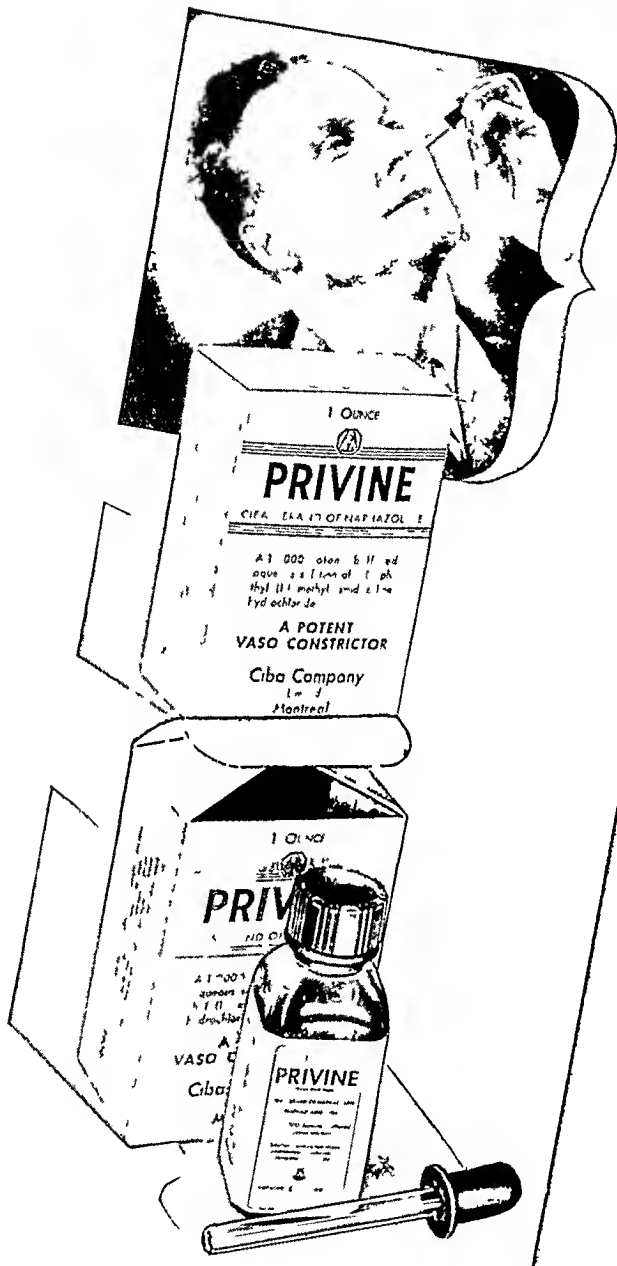
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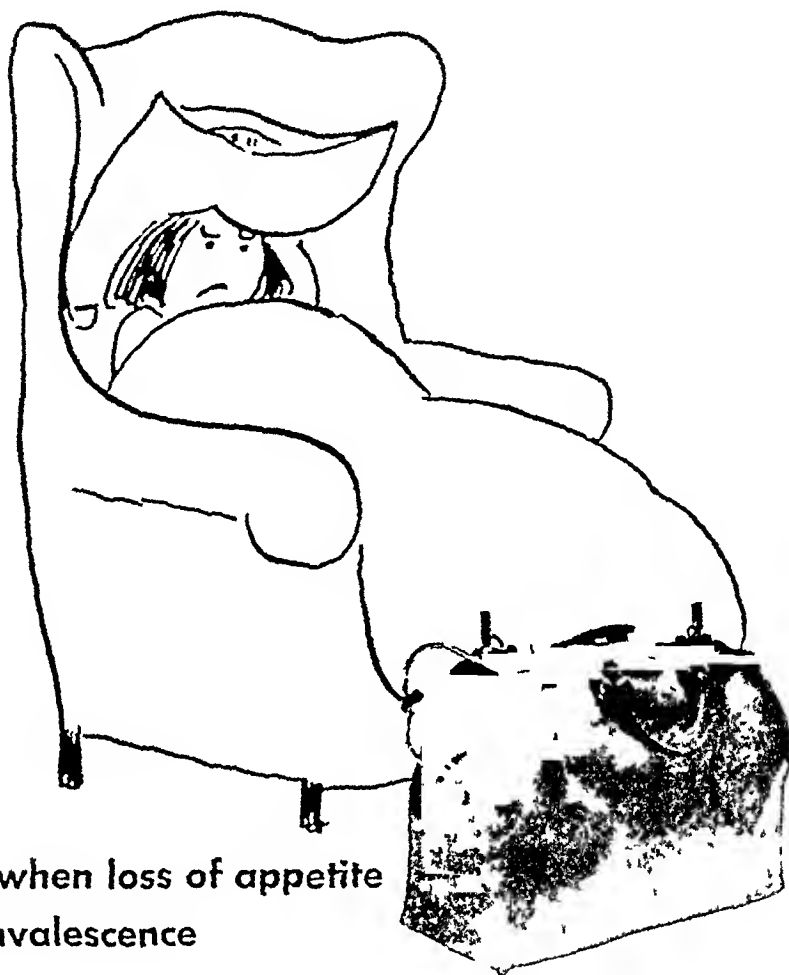
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ESKAY'S THERANATES—outstandingly palatable, light and easily tolerated—is the ideal tonic to restore appetite, increase intake of necessary nutritional factors, and thus speed the convalescent to full recovery

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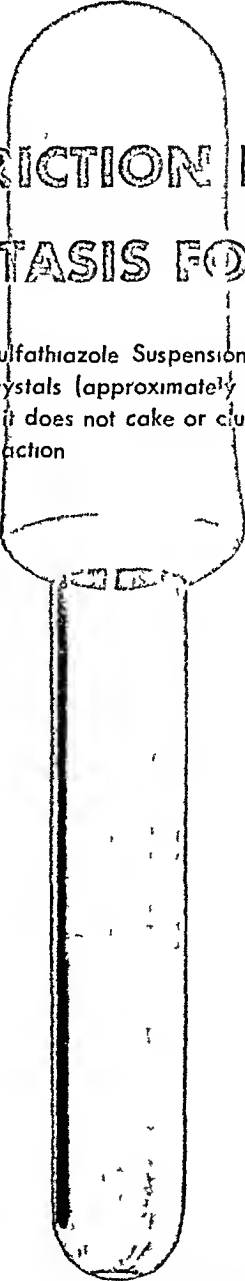
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In bottles of 100 and 1000 tablets



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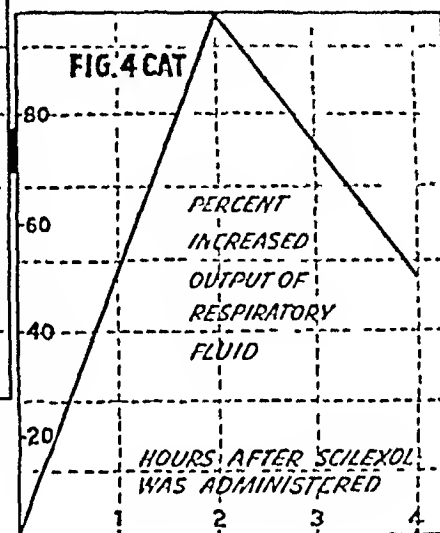
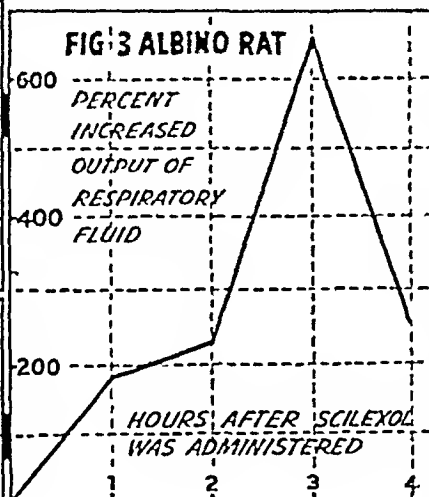
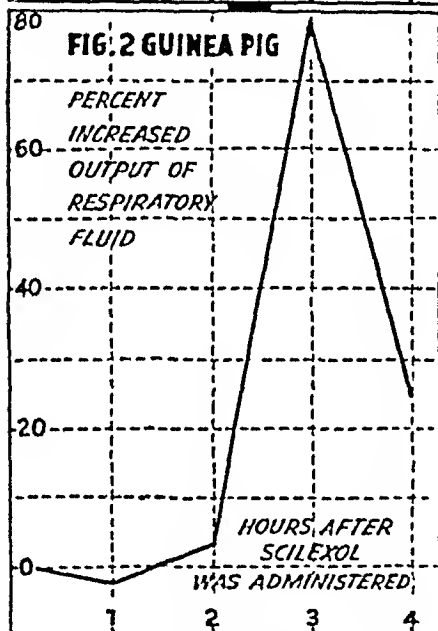
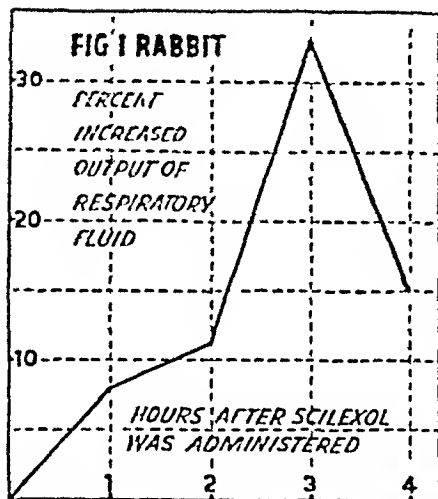
Because Paredrine-Sulfathiazole Suspension contains Microform sulfathiazole crystals (approximately 1/1000 the mass of ordinary crystals) it does not cake or clump and does not inhibit normal ciliary action

PAREDRIE - SULFATHIAZOLE SUSPENSION

To help shorten the course of infection and avert sequelae to colds.

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Biological Tests Confirm the Expectorant Action of SCILEXOL E.B.S.



THE ACCOMPANYING GRAPHS show pictorially, the increased excretion of respiratory tract fluid in four different species of mammals to which were administered Scilexol with Camphorated Tincture of Opium in doses of 0.1 ml per kilo of body weight. The results obtained in an independent laboratory, confirm our belief that Scilexol is an efficient expectorant cough preparation.

Clinically, it is found that Scilexol is particularly effective when combined with sedatives. The Scilexol actively increases the volume and fluidity of respiratory tract secretions so that the cough can readily move them along to the throat for excretion. At the same time the sedative temporarily depresses the cough center, thus preventing the exhausting fits of unproductive coughing brought on by residual irritation in the throat rather than by the presence of mucus to be removed.

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Ammonium Chloride	16 grs	Acid Hydrochloric	1.0 fl. oz.
Chloroform	2 min.	Syrup Scilla	0.1 fl. oz.
	Syrup Tolu		120 min.

Scilexol is supplied plain or with your choice of the following sedatives* when specified

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| 1. Tincture Opium Camphorated | 80 min. per oz. |
| 2. Dextromorphine Hydrochloride (Dinorm) | 2 grs per oz. |
| 3. Codeine | 1 gr per oz. |
| 4. Morphine | 2 grs per oz. |
- * or codeine mixed



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Total 11.0 g

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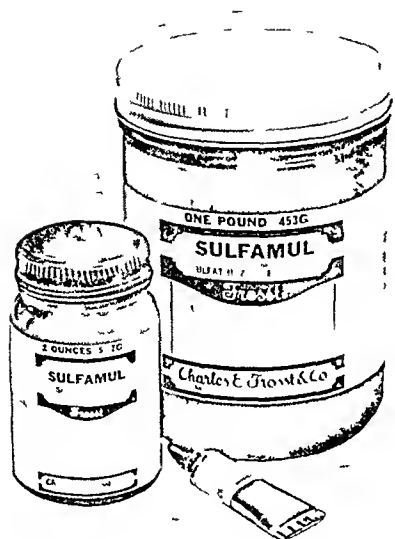
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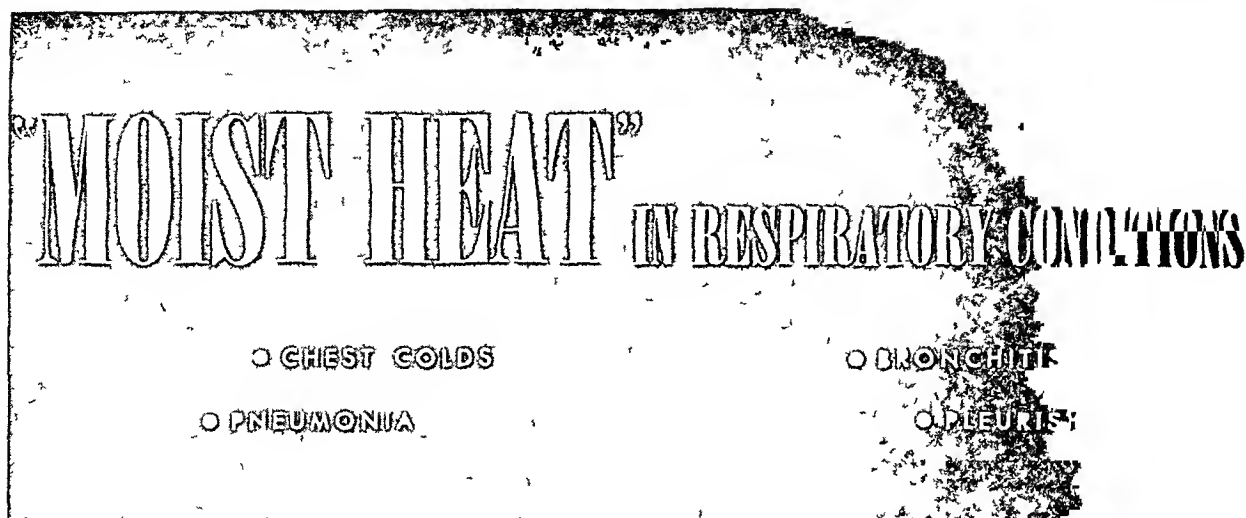


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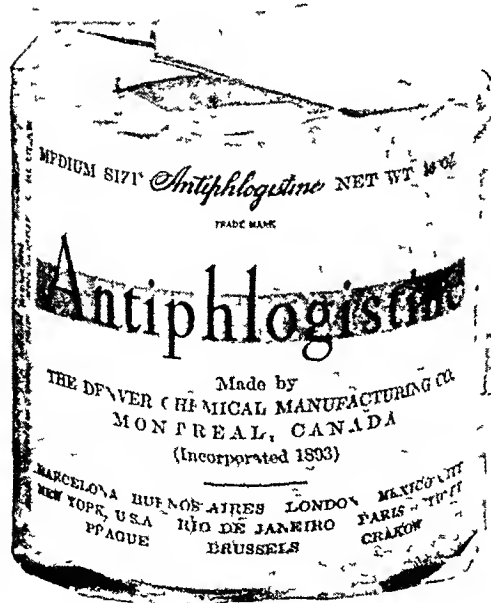
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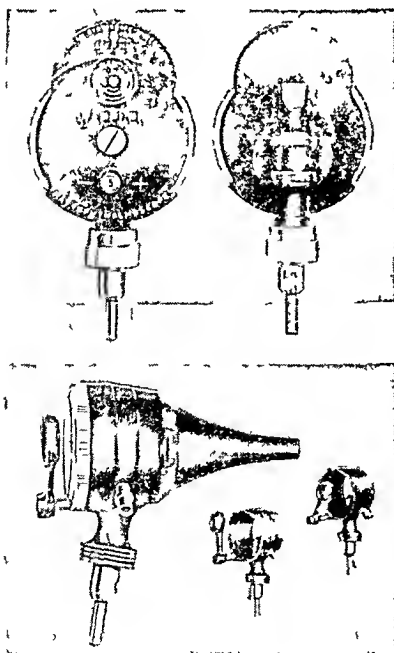


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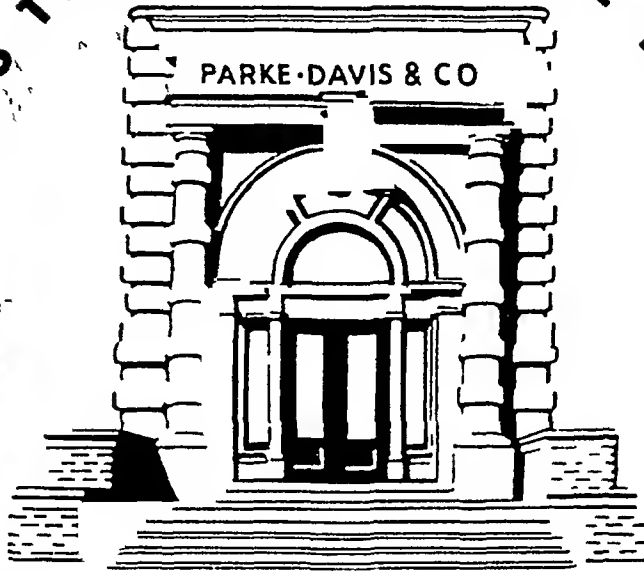
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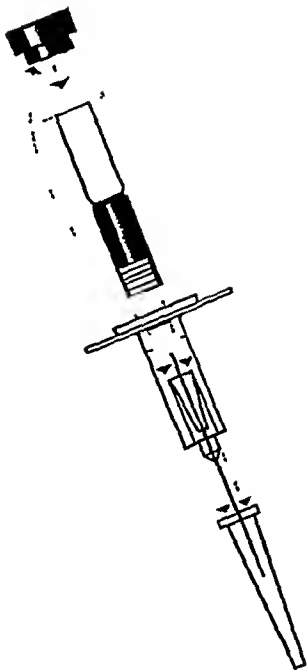


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The Canadian Medical Association Journal

Vol 55

Toronto, November, 1946

No 5

ASCORBIC ACID METABOLISM AFTER TRAUMA IN MAN*

By W A Andreas, Ph D and
J S L Browne, M D

*McGill University Clinic,
Royal Victoria Hospital, Montreal*

FOR centuries it has been realized that in scorbutic patients the healing process is retarded and that reopening of old wounds and the refracture of bones may occur. The recent experiment of Crandon *et al*^{11,12} on a human subject demonstrated beyond doubt that wound healing is impaired on an ascorbic acid deficient diet, a condition which can be promptly corrected by the administration of large doses of ascorbic acid.

However, the physiological rôle of ascorbic acid in the acutely injured patient is still obscure. Experimental work with guinea pigs has produced certain clues as to the action of ascorbic acid in the tissues of these animals. Histological studies on experimentally injured, scorbutic guinea pigs demonstrated the complete failure of callus formation as well as the resorption of old callus. Furthermore, there was no formation of reticulum and collagen.^{14,15} Laneman¹⁶ showed that the tensile strength of the healing wound in vitamin C deficient guinea pigs is considerably lower than in the normal animal and Baitlett¹⁷ reported a greater ascorbic acid content in the scar area of scorbutic guinea pigs at low vitamin C levels than in the surrounding tissues. This differentiation could not be demonstrated on a medium or high intake. Bourne¹⁸ showed that bone healing in guinea pigs is only retarded when the ascorbic acid intake is very low. The injection of calcium ascorbate accelerated the healing of experimental bone injuries in rats while calcium gluconate was ineffective, and

this was interpreted as a specific rôle of ascorbic acid in the calcium deposition in the healing bone.

Lund and Crandon^{11,12} studied the vitamin C status of ward patients with delayed wound healing and found that the blood ascorbic acid approached zero level. In the opinion of these workers, the low blood ascorbic acid content was not a proof of an increased ascorbic acid requirement, but was ascribed to the low ascorbic acid intake in these patients prior to injury. It was further noted that the administration of ascorbic acid caused the return of the blood ascorbic acid content to normal levels more quickly than was observed in uninjured, scorbutic patients. They considered that the impaired healing which was also observed in these patients could be ascribed to the operative technique and was not necessarily due to the ascorbic acid depletion of the tissues.

From the evidence obtained with guinea pig experiments and from observations on twenty-eight clinical cases, Hunt¹⁹ suggested that all patients should receive 1,000 mgm ascorbic acid for three days prior to operation and 100 mgm thereafter. However, this amount was arbitrarily chosen, there is no direct experimental evidence that this amount is required. Levenson, Green, Taylor, Robinson, Page, Johnson and Lund²⁰ have carried out vitamin balance studies on patients after injury and burns and found an increased ascorbic acid retention. They believe that 225 mgm ascorbic acid daily may not be sufficient to meet the demand of surgical patients and that 500 to 1,000 mgm represent a more correct estimate of the ascorbic acid requirement in damage.

Ascorbic acid metabolism was studied in normal individuals by van Eekelen²¹ who recognized the interdependence between the dietary vitamin C intake, the plasma ascorbic acid, and the ascorbic acid excretion. On a low intake the plasma level was also low, on a raised intake the plasma level rose up to 13 mgm but not above this level. The latter condition

* This work was aided by a grant from the Associate Committee on Army Medical Research, National Research Council of Canada.

The ascorbic acid used in these studies was Redoxon of Hoffmann-La Roche in Canada and provided through the courtesy of Dr. Ruth Wolfe.

was termed the "state of ascorbic acid saturation". From balance experiments on the same individual, van Eekeln calculated the average daily ascorbic acid retention and noted that at plasma levels below the saturation point the retention decreased. Recently Melnick *et al*²⁷ have developed a technique to assess the availability of ingested ascorbic acid in normal, ascorbic acid saturated subjects. A standard diet providing a constant intake of 115 mgm ascorbic acid was given throughout the experimental period. On this intake about 30 mgm were excreted. On an ascorbic acid intake above the basal intake, there was a proportionate increase in ascorbic acid excretion which amounted to 65% of the ingested dose. The patients reported in the present paper were also maintained in a state of ascorbic acid saturation. This was accomplished by raising the daily intake by administration of crystalline ascorbic acid. Any change in the ascorbic acid retention was then ascribed to metabolic changes in the patient during the period of study. The degree of tissue saturation was assessed from ascorbic acid determinations of whole blood and white cells at frequent intervals.

The difficulty of assessing the function of ascorbic acid in traumatized individuals lies in the inherent complexity of biological research in humans, due, in great part to the diversity of the clinical and nutritional background of individual patients. Most of the earlier clinical observations dealt with injuries in patients suffering overt scurvy, little is yet known about the ascorbic acid metabolism in the patient of average nutrition at the time of admission to hospital. The present study deals with the ascorbic acid metabolism in patients of the latter type. Preliminary reports were presented at the Macy Conference⁶ and the Canadian Physiological Society.¹

METHODS

The dietary intake of the patients was rigorously controlled throughout the metabolic studies. The food was prepared in a special diet kitchen; each constituent was weighed before serving and careful notes were taken of any returns to ensure accurate records of the daily intake. The amount of vitamins ingested was estimated from the National Research Council Washington Tables, 1943.²⁸ The dif-

ference between the desired level of vitamin intake and the quantity furnished by the diet was administered in the form of vitamin tablets. The daily vitamin supplements were given in three divided doses at meal times. The efficacy of estimating the dietary ascorbic acid intake by the NRC Washington tables under the condition of the hospital diet kitchen was tested by comparison of the calculated amounts with those of chemical analysis. Aliquots of eight daily diets, fortified with ascorbic acid tablets and 53 individual foods were mixed with seven parts of 3% metaphosphoric acid to three parts of material. The mixture was homogenized in a Waring blender and weighed. A portion of the pulp was centrifuged and the clear supernatant liquid analyzed for reduced ascorbic acid by the same method as for the urine analysis. The results obtained from food tables were on the average 7% higher than when estimated chemically.

Twenty-four hour urine specimens were collected in dark bottles containing 75 ml of 10% oxalic acid. The urine bottle was placed in a covered box beside the patient's bed and emptied every morning at 8 o'clock after the last voiding.

The reduced ascorbic acid was determined by the colorimetric method of Evelyn *et al*.¹⁴ The total ascorbic acid in the urine was determined by the method of Roe and Knether.³⁰

The ascorbic acid content in whole blood and white cells was carried out by the method of Butler, Cushman and McLachlan.⁹

CASE REPORTS AND RESULTS

Three normal controls, 14 cases of fractures and 7 cases of burns were studied. The metabolic data are presented in Table I for all cases and in Figs 1 to 6 for cases 92, 113, 119, 131, 135 and 142.

Clinical details are omitted for lack of space but are available on application to the authors.

DISCUSSION

A low ascorbic acid excretion, relative to the intake characterizes the ascorbic acid metabolism of burn and fracture patients of this study during the period immediately after injury. This response could be best demonstrated when the daily vitamin C intake was maintained at a high and constant level throughout the metabolic studies by supplementation with

crystalline ascorbic acid. On such a regimen the patient's ascorbic acid status changed from a state of depletion as caused by the injury into a state of saturation which could be recognized by (a) a rise in the blood ascorbic acid content from below 0.2 to about 0.7 mgm % and (b) an abrupt decline in the ascorbic acid retention.

The period which elapsed before saturation was achieved depended primarily upon the ascorbic acid dose and to a lesser extent upon the degree of injury while the total amount of retained ascorbic acid was independent of the dose. It was found that generally more ascorbic acid was retained after burns than after fractures.

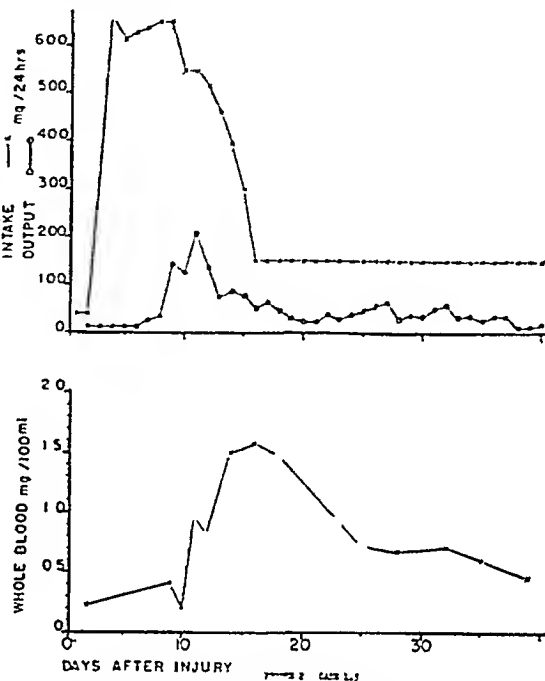
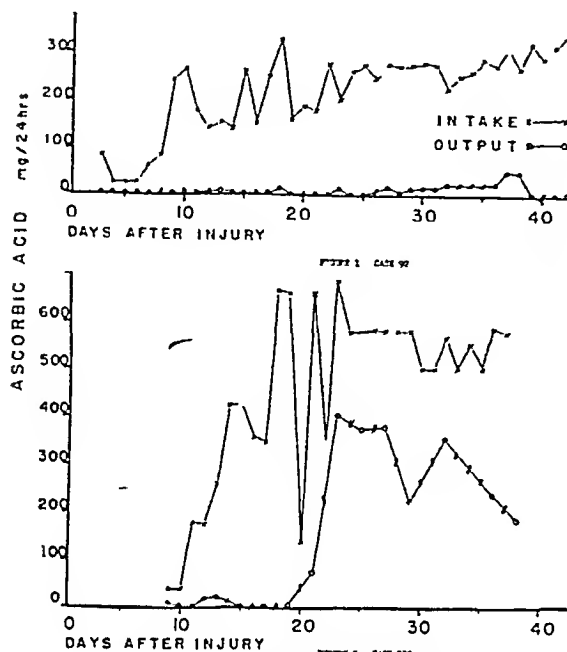


Fig 1 (Case 92)—Burn patient, male, age 36 years, suffered flame burns on arms, neck, chest buttock and thigh. Fig 3 (Case 119)—Burn patient, female, age 32 years, suffered hot water burn from the calves of the leg up to the breast. Fig 2 (Case 113)—Fracture patient, male, age 23 years, suffered fractures of femur and ulna, and laceration of buttock, knee and hand.

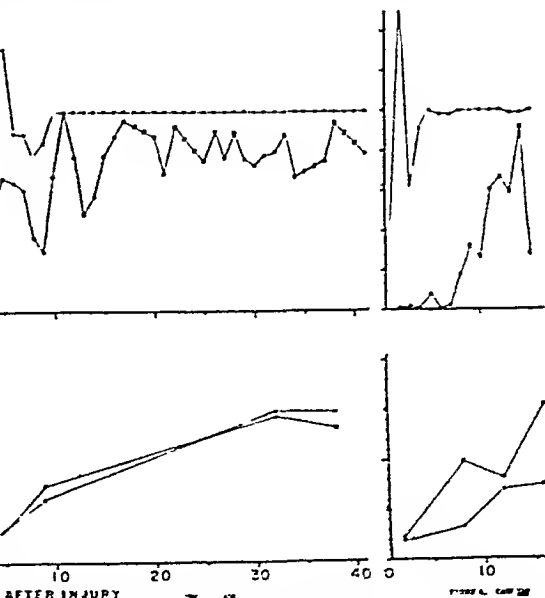
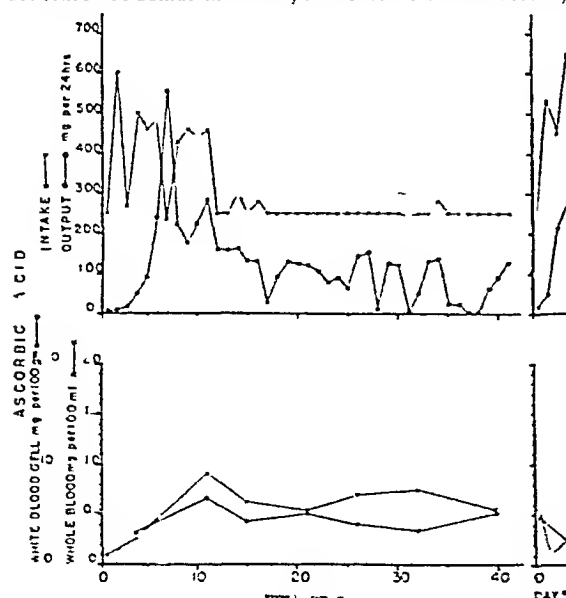


Fig 4 (Case 131)—Fracture patient, male, age 42 years, suffered fracture of femur. Fig 5 (Case 135)—Burn patient, male, age 61 years, suffered steam burn over legs and forearms. Fig 6 (Case 132)—Fracture patient, male, age 36 years, suffered fracture of fibula and tibia.

TABLE I

THE AVERAGE RETENTION OF ASCORBIC ACID AND THE WHOLE BLOOD ASCORBIC ACID CONTENT
OF NORMAL AND TRAUMATIZED PATIENTS

Case	Injury ***	Period of non-saturation**				Period of saturation			
		Days*	Average intake mgm 24 hrs	Average retention mgm 24 hrs	Whole blood level mgm % (Days*)	Days*	Average intake mgm 24 hrs	Average retention mgm 24 hrs	Whole blood level mgm % (Days*)
115	N	Nil				1-17	150	59	0.37 (1), 0.63 (5)
116	N	1	150	131		2-14	150	74	0.46 (10) 0.71 (4), 0.53 (8) 0.94 (11)
138	N	1	500	464	0.32 (1)	2-18	470	120	0.92 (5), 0.74 (15)
138	N	1	500	294		2-7	500	123	0.79 (2), 0.86 (4) 1.10 (6)
80	F	12-23	330	Not studied		24-88	412	132	0.97 (40)
86	F	6-20	332	276		21-31	429	196	0.91 (21)
87	F	10-31	139	129		32-99	268	158	0.76 (32)
88	F	8-22	106	97		23-49	152	103	0.75 (28)
92	B	8-39	258	242					
113	F	3-9	628	568	0.21 (2), 0.42 (9), 0.21 (10)	16-42	150	116	1.59 (16), 1.49 (18), 0.94 (23), 0.73 (25), 0.68 (28)
117	F	7-16	150	141	0.14 (7), 0.24 (10), 0.32 (16)				
119	B	11-22	386	373		23-36	550	243	
128	B	3-8	520	509		9-16	520	151	
131	F	2-5	457	416	0.11 (1), 0.26 (4)	6-46	278	159	0.9 (11), 0.63 (15), 0.53 (21), 0.7 (26), 0.74 (32), 0.54 (40) 0.86 (4), 1.2 (8), 0.96 (15), 0.67 (23), 1.7 (31)
134	B	1-3	1,031	911	0.30 (1), 0.08 (2)	5-30	1,030	245	0.64 (9), 1.5 (32), 1.5 (38), 0.9 (45), 0.79 (54)
135	B	1-3	409	313	0.56 (1), 0.10 (2), 0.28 (4)	5-54	519	145	0.81 (4), 1.0 (8), 1.2 (15), 0.78 (23), 1.7 (32), 1.6 (38)
136	B	1-3	990	915	0.34 (1), 0.03 (2)	5-54	998	208	1.1 (11), 1.2 (20), 0.57 (34)
140	F	1-10	495	428	0.09 (4), 0.64 (7)	11-56	480	196	0.7 (12), 0.74 (16)
142	F	1-10	472	427	0.20 (2), 0.22 (3), 0.33 (8)	11-15	498	94	
148	F	1-4	452	423	0.24 (1), 0.19 (2) 0.54 (4)	5-19	520	168	0.45 (7), 1.1 (15)
149	F	3-5	500	470	0.32 (2)	6-26	500	271	1.0 (6), 0.86 (10), 1.1 (19)
155	F	5-9	545	506		10-27	492	244	
89	B	58	134	128		59-125	160	126	
120	F	102	368	312		103-146	264	110	
124	F	107-109	499	249		110-132	140	116	

* For normals—Days of metabolic study

For patients—Days after injury, the first day recorded designates the beginning of the metabolic study

** Period from beginning of the metabolic study until a rise in urinary ascorbic acid occurred

*** N—Normal F—Fracture B—Burn

Various factors which could result in an increased retention of ascorbic acid independently of the physiological need of ascorbic acid at that time were investigated, namely (a) loss of ascorbic acid during storage of the urine before analysis, (b) excretion of ascorbic acid in the reversibly oxidized form, dehydroascorbic acid, (c) failure of absorption of ascorbic acid from the intestine, (d) impaired excretion immediately after injury, (e) retention of ascorbic acid in the oedema fluid, (f) loss of ascorbic acid through the blister fluid, (g) nutritional deficiency of ascorbic acid prior to the injury

The stability of ascorbic acid in urine of normal and injured patients was tested. Oxalic acid was added in all cases to the urine collection bottles. The loss of ascorbic acid in both groups varied from 0 to 10% within 24 hours at room temperature, thus excluding the presence of compounds in the urine of damaged patients which might have hastened the destruction of ascorbic acid.

The ascorbic acid determinations in most cases were carried out for reduced ascorbic acid only. In order to determine whether the low excretion of reduced ascorbic acid was due to increased excretion of the dehydro form, the urine of three burn and three fracture cases was analyzed for total ascorbic acid by the Roe *et al*, method³⁰. The quantitative difference between the method for total and reduced ascorbic acid represents the amount of dehydroascorbic acid in the urine. In these cases the dehydroascorbic acid represented from zero to 56% of the total ascorbic acid immediately after injury and from zero to 22% during late stages of convalescence. Negative values for dehydroascorbic acid also occurred. Beryman *et al*³ have determined the total and reduced ascorbic acid in the urine of 68 soldiers during a six-hour period following administration of 200 mgm ascorbic acid. They found that the proportion of dehydro to reduced ascorbic acid remained constant at various excretion levels and that the dehydroascorbic acid constituted 18% of the total ascorbic acid in normal subjects. Muntoni²⁸ has shown that after surgical operations, the ratio of dehydro to reduced ascorbic acid increased. Our results indicated that the partition of reduced and dehydro urinary ascorbic acid in damage did not differ greatly from normals during the period

of convalescence, but was increased during the early period of damage. The absolute amount of dehydroascorbic acid was still small however. Thus the low reduced ascorbic acid excretion cannot be explained on the basis of a large excretion of dehydroascorbic acid.

The daily loss of unabsorbed ascorbic acid in the faeces was not determined in these investigations but is normally small. With intakes varying from 73 to 1,054 mgm Chinn and Farmer¹⁰ found the faecal excretion to average between 5 and 14 mgm. The ascorbic acid loss in the faeces during diarrhoea was much larger, (Farmer *et al*,)¹¹ Furthermore, destruction of ascorbic acid by bacteria common to the intestinal tract could be demonstrated by Kendall and Chinn¹⁸ to be slight. All patients in the present study received oral doses of ascorbic acid except case 128 who received daily 500 mgm ascorbic acid intramuscularly. The vitamin doses of cases 134, 135, and 136 on the evening of admission was also given intramuscularly. Despite the different route of administration, these patients showed the same initial low ascorbic acid excretion.

Certain information regarding the fate of the retained ascorbic acid could be derived from the blood ascorbic acid studies. A repetition of the blood analysis on cases 134, 135 and 136 twenty hours after admission indicated that the blood ascorbic acid had fallen from 0.30, 0.56 and 0.34 mgm % to 0.08, 0.10 and 0.03 mgm % respectively. This occurred in spite of the administration of 500, 250 and 500 mgm ascorbic acid twelve hours prior to the collection of the second blood sample. Blood ascorbic acid values below 0.25 mgm % were also found in the fracture cases 113, 131, 140, 142 and 148, after the first day of injury. All these findings point towards an immediate rapid ascorbic acid utilization or destruction resulting in the depletion of the body's store, as well as the disappearance of ingested ascorbic acid.

While a low ascorbic acid excretion in uninjured subjects signifies a state of ascorbic acid depletion, the low excretion observed in patients immediately after injury does not necessarily permit the same conclusion. Here the picture may be complicated by an impaired excretion of ascorbic acid, retention in the oedema fluid, or loss in the blister fluid. In these studies a low blood ascorbic acid content always appeared 24 hours after injury, and it

was not until the blood ascorbic acid began to rise that the urinary excretion of ascorbic acid increased. The close correlation between urinary excretion and blood ascorbic acid thus eliminates impaired kidney function as the possible cause of low ascorbic acid excretion, but still leaves the question of ascorbic acid retention in the extra-cellular fluid for consideration. It was observed that during the period following injury, the urine volume and the ascorbic acid excretion were both low. At such a time a low urine volume signifies oedema fluid formation. When after several days the urine volume showed a marked rise, the ascorbic acid excretion did not show a concomitant augmentation.

In addition to early fluid retention and later discharge of oedema fluid, there is in burns a continuous seepage from the burn area. The magnitude of ascorbic acid loss by this route could not be estimated by direct analysis of blister fluid in these patients because of the prompt application of pressure bandages to the burned areas on admission. However, it could be shown that blister fluid, from blisters raised experimentally with cantharides as the irritant, contained vitamin C at about the same concentration as in the plasma at the time of blister formation. The magnitude of the ascorbic acid loss in blister fluid in our patients must be very small, as the daily loss of one or even two litres of fluid would not account for more than 10 to 20 mgm ascorbic acid.

According to Butler and Cushman^{7, 8, 9} the white cell ascorbic acid is an index of the ascorbic acid content of the body tissues. We have determined the white cell ascorbic acid content of acutely damaged patients in order to investigate whether this vitamin was still present in the tissue cells during the period when there was little in the blood and urine.

The white cell ascorbic acid content of twelve normal subjects was first determined in order to establish a normal range. The white cell ascorbic acid content was found to fall between 6.7 and 16.9 mgm %. These values are much lower than those reported by Butler and Cushman^{7, 8, 9} who consider 34 mgm % an average value for normal controls, but agree well with other workers. Lloyd *et al*²¹ report 0.0 to 15.4 mgm % as the range in 89 specimens, and Lubshez²⁴ found that the majority of children in her study showed a range be-

tween 11 to 30 mgm %. All the acutely damaged cases studied by us showed a low white cell ascorbic acid content one day after admission to hospital and in none of these did the white cell ascorbic acid exceed 20 mgm % during a period of 15 to 20 days on a high ascorbic acid intake while a rise of 30 to 40 mgm % occurred in normals within seven days.

These metabolic studies were restricted to well-nourished patients with no clinical symptoms of vitamin deficiency except for case 117 who developed generalized petechiae four days after injury while on the hospital diet. The selection of patients was necessary to reduce the effect of the patient's diet prior to injury upon the ascorbic acid retention during the metabolic period.

In a saturation test, devised by Harris,¹⁶ a dose of 700 mgm of ascorbic acid per 140 lb of body weight resulted in a high ascorbic acid retention for one day in normals and for two to three days in those subjects where the diet had been inadequate in the past. We too have observed in a series of three normal controls an initial high ascorbic acid retention for one to two days when the experimental diet of high ascorbic acid content was introduced. It must be assumed that a similar period would elapse in these patients in order to adapt themselves to the new regimen. Several observed facts, however, suggest that the prolonged high ascorbic acid retention in acutely injured patients is not primarily caused by a previously deficient diet but by the physiological condition of the patient at the time when the metabolic studies were conducted. First, in all our patients, the period of high retention was of longer duration than would be expected if the patient suffered only a mild nutritional deficiency on admission. This period extended to as much as two weeks in case 119 who retained during this period a total of 3 grams of ascorbic acid. Secondly, in patients in which metabolic studies were begun several months after the acute injury had occurred, (cases 89, 120, and 124), a high ascorbic acid retention of only one to two days, similar to normals, was observed. Finally, the whole blood ascorbic acid content a few hours after admission was compared with a group of twelve normal controls. Values of 0.26 to 0.86 mgm % were common to both groups. From these blood ascorbic acid studies and from the dietary history and

the clinical picture of these patients, it was felt that these patients did not represent a group of individuals depleted of ascorbic acid prior to admission.

As far as the above evidence goes it indicates that none of the above factors accounts for the marked retention of ascorbic acid after burns and fractures. Thus there appears to be a rapid and marked destruction or utilization of ascorbic acid during the period immediately following injury. It may be that the metabolic processes after burns or fractures cause a sudden generalized destruction of the vitamin C in the body tissues and that the large amount of ascorbic acid which is required to bring about a rise in the blood ascorbic acid and the urinary excretion merely refills the depleted tissues. Under such conditions, one would expect an increased outpouring of the breakdown products beyond the dehydroascorbic acid stage. Rosenfeld²¹ showed that under approximately physiological conditions there is a nonoxidative formation of oxalic acid from dehydroascorbic acid. Whether or not there is any increased excretion of this breakdown product in traumatized patients has not been investigated. Even if those values did not show any significant increase, a rapid complete breakdown of ascorbic acid to carbon dioxide and water cannot be excluded.

There are many physiological functions in which ascorbic acid could be utilized. Ascorbic acid might be built into newly formed tissues and its retention would therefore increase whenever tissue metabolism takes place. However, the striking retention of ascorbic acid occurred in the early stage of damage and is not as marked during the later stage of convalescence when nitrogen metabolism studies indicated tissue anabolism.

The immediate increased requirement of ascorbic acid in damage might be due to the participation of ascorbic acid in cortical hormone synthesis. As early as 1933, Lockwood and Hartman^{22, 23} were struck by the similarity of some of the symptoms of adrenal cortical insufficiency and scurvy. In their papers^{22, 23} they showed that cortical hormone extracts, free from ascorbic acid, ameliorated some of the symptoms of scurvy, improved the growth curve, and increased the life span of the animals.

Sayer *et al.*,³² have found that an intraperitoneal injection of adrenotropic hormones resulted in a prompt decrease in the ascorbic acid content of the adrenal, which reached a minimum at one hour of 40% of its original level. The cholesterol content likewise fell, but at a slower rate, reaching a minimum of 50% of its original level at three hours. Within 24 hours, both values returned to normal levels. The marked changes in adrenal cholesterol and ascorbic acid following administration of adrenotropic hormones suggests that those two substances are involved in cortical hormone synthesis.

Investigations on the cortin excretion in acutely damaged individuals are in progress in this laboratory and indicate that the excretion rises from a normal value of 60 to 80 glycogen units to 200 to 300 glycogen units within a few days after injury and declines after a week or two to normal levels (Venning and Browne).³³ However, no quantitative relationship can be derived from these findings. The cortin excretion, expressed as glycogen units (one unit equals one microgram of compound E) cannot account for several hundred milligrams of the ascorbic acid retained in damage during the same period. It is of interest, however, to note that the period of high cortin excretion (which is believed to be an index of adrenal activity) corresponds with the period of increased ascorbic acid retention. Finally there may be other unknown metabolic processes taking place immediately after injury in which ascorbic acid is utilized.

Although it cannot be decided from the evidence on hand whether the ascorbic acid retained above normal levels in damage is utilized or is destroyed, biochemical data indicate that during the initial period of damage a similar condition exists as is found in individuals on a scorbutic regimen. In the experiment of Crandon *et al.*,^{11, 12} when the subject was maintained on a vitamin C free diet, the plasma ascorbic acid fell from 1.0 mgm % on day 1 to 0.14 mgm % by day 11. Although our determinations were carried out on whole blood, and are therefore, not strictly comparable with Crandon's, they indicate a rapid fall in the whole blood ascorbic acid from normal levels to below 0.1 mgm % within 24 hours following acute damage. In Crandon's experiment 82 days elapsed before the white

cell ascorbic acid reached 40 mgm % we frequently encountered such low values as soon as 24 hours after injury. If the low whole blood and white cell ascorbic acid values found after damage are indicative of a state of body depletion, then many of our cases approach scorbutic levels extremely rapidly following acute damage, in spite of the addition of large daily supplements of ascorbic acid to these patients.

While in Crandon's experiment, the vitamin C depletion was caused by a deficient dietary intake, a condition referred to as primary deficiency, the vitamin C depletion in damage may be due to some metabolic process conditioned by the acute injury. There were no obvious symptoms of scurvy in our patients except that one case (case 117) who did not receive any ascorbic acid until day 7 developed generalized petechiae during the first four days of injury. His previous diet was deficient in vitamin C but no symptoms of ascorbic acid deficiency were noted on admission. We have not investigated whether histological derangement in the wound area similar to that found in scorbutic patients can be encountered in individuals suffering an acute injury with no ascorbic acid supplementation.

Crandon has shown by histological examination that an experimental wound will heal normally in an individual who has been vitamin C depleted for three months. After six months on the vitamin C free diet when the plasma ascorbic acid had been zero for five months, and three weeks after the onset of frank scurvy wound healing still appeared to progress. However, when on the tenth postoperative day a biopsy of the wound was made, it was found that beneath the skin there was no healing of the tissues. Sections of the wound showed a lack of intercellular substance and capillary formation. This experiment demonstrated that wounds can still heal even if no ascorbic acid is present in the plasma but at just what degree of depletion delayed healing begins, we do not know. In our studies the low blood ascorbic acid values were not caused by a deficient dietary intake but were probably the result of a rapid tissue depletion, thus it is conceivable that the onset of delayed wound healing might occur more rapidly in our patients than in Crandon's experiment.

COMMENTS

Our results indicate that the ascorbic acid retention is tremendously increased following damage. Most of our patients received 500 to 700 mgm ascorbic acid during about six days following damage before saturation was achieved. These doses were of almost the same magnitude as those required after the onset of experimental scurvy to saturate the organism and to permit wound healing. There is, however, no indication from our studies that the high ascorbic acid intake affected the clinical progress of the patient.

The assistance of Dr M E F Hunter at the beginning of this investigation in organizing the laboratory techniques is gratefully acknowledged, the technical assistance of Miss Janet Alexander, Miss Frances Ingersoll, Mrs Jane Russell, Miss L Newman, Miss Janet Slack and Mrs Anne Hardman is acknowledged.

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BILATERAL FRONTAL LOBE LEUCOTOMY IN THE TREATMENT OF MENTAL DISEASE

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THIS paper is based on 27 consecutive cases of bilateral frontal lobe leucotomy. It presents a brief historical review, a physiological basis for the operation, the operative technique, and the selection of patients and results.

HISTORICAL REVIEW

Moniz of Portugal¹ was impressed after reading the following description by Jacobsen² of the behaviour of a chimpanzee after removal of both frontal arcs:

"The chimpanzee offered the usual friendly greeting and eagerly ran from its living quarters to the transfer cage, and in turn went promptly to the experimental cage. The usual procedure of baiting the cup and lowering the opaque screen was followed. The chimpanzee did not, however, show its usual excitement, but rather quietly knelt before the cage or walked around. Given an opportunity, it chose between the cups with its customary eagerness and alacrity. However, whenever the animal made a mistake, it showed no emotional disturbance but quietly awaited the lowering of the cup for the next trial. The opaque door was again lowered but without untoward effect, and if the animal failed again it merely continued to play quietly or to pick over its fur. Thus, while the animal repeatedly failed and made a far greater number of errors than it had previously, it was quite impossible to evoke even a suggestion of an experimental neurosis. It was as if the animal had joined the 'happiness cult' of the Elder Mithras and had placed its burdens on the Lord.

Egair Moniz published his monograph in 1936 covering the first 20 cases, operated on by Almeida Lima under his direction during 1935 and 1936. The first prefrontal lobe leucotomy in the United States was done by Freeman and Watts^{3, 4, 5, 6} in September, 1936, and they published an excellent book on this subject entitled "Psycho surgery" in 1942. Gradually following the lead of Freeman and Watts more than 1,000 cases⁷⁻¹¹ have been done on this continent in many centres. Lyerly,⁶ Giant⁸ and Love⁹ have all reported a dozen or more cases from their respective clinics.

PHYSIOLOGICAL BASIS FOR LEUCOTOMY

Spinal reflexes alone are responsible for most behaviour patterns in the lower vertebrates.

As complexity develops, there is need for control of these reflexes and co-ordination of them with cranial afferents (smell, hearing, sight etc.) thus the basal ganglia develop and in most pre-mammalian forms represent the large part of the brain. Here simple memory patterns are stored and reflexes are co-ordinated. Functions having to do with survival such as feeding, migration, mating, heat and body fluid regulation, sugar and fat metabolism, are implemented in these basal ganglia. In whole or in part these functions are retained in these basal ganglia in the higher vertebrates and primates and the human brain. In these higher forms the increasing complexity of reflexes has necessitated a still further development of the brain namely the cortex and its white matter. The nervous system comes under the control, in part or in whole, of this superadded cell structure with its mass of association fibres.

Fig 1 indicates the important sensory impulses from skin, joints, muscles, eyes and ears which are relayed to the cortex. These impulses are analyzed and stored in the cortex adjacent to the special cortical reception areas. There is thus an anatomical explanation for the fact that the human without his frontal lobes is capable of describing in detail an object which he sees, hears and feels, etc., *eg*, a tree has leaves, bark, branches, the leaves rustle and the bark is rough, cold and has a certain texture. Incoming impulses may be stored for future use or immediately result in out-going impulses such as motor action or speech.

All this is possible without the frontal lobes, the last portion of the cortex to be developed phylogenetically and reaching its highest development in the human.

It is with the frontal lobes that we are especially concerned in the operation of frontal lobe leucotomy, a procedure which divides many association fibres in the white matter of these lobes. In the human mind there is no obvious intellectual defect following the removal of either frontal lobe. When both lobes are removed the individual shows a marked change (Bruckner¹⁰). This change can be compared to the inebriate state without ataxia. The individual becomes boastful, careless and lacks judgment. He lacks initiative and is incapable of planning and cannot grasp complicated problems. Such an individual could operate a simple boat. He would require his

* Read at the Seventy-seventh Annual Meeting of the Canadian Medical Association, Section of Psychiatry, Banff, Alberta, June 12, 1946.

frontal lobes, however, to be taught anything more than the rudiments of sailing. He would require his frontal lobes to appreciate the danger of a storm and plan appropriate action. Such complicated thinking, where one idea follows another logically, has been termed by the psychiatrist, synthesis. The reaction following such thinking is governed by judgment. Synthesis and judgment are both conditioned by knowledge learned in the past (experience), and further conditioned by emotional tone (mood).

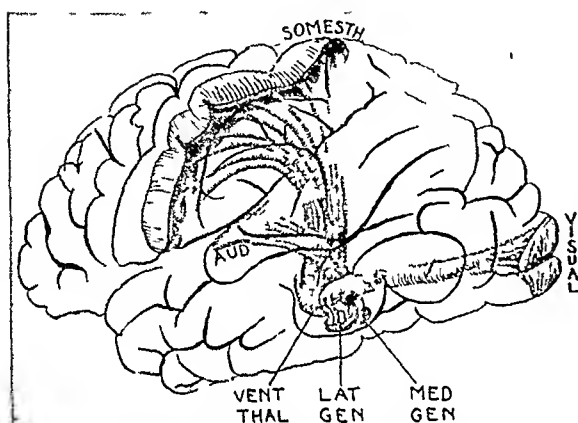


Fig 1—From *Functional Anatomy* by Kreis, showing the sensory tracts within the brain for impulses from skin, joints, muscles, eyes and ears to the cortex.

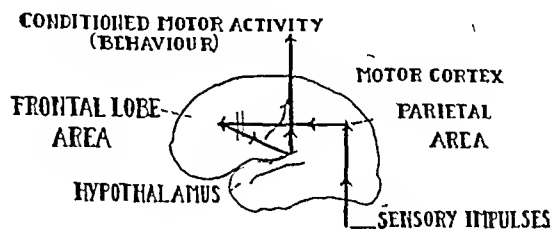
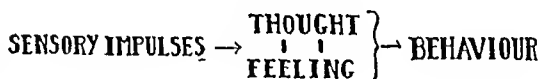
We are aware that all behaviour is conditioned by emotional tone. It has been shown that there are basal centres (hypothalamus) which, in the animal deprived of his frontal lobes, can produce on stimulation a state of fear to the point of protective combat.¹² However, such emotional tone is a primitive survival mechanism and does not allow the fine judgment that is required in our complex social life. This primitive reaction is conditioned by centres in the frontal lobes, and if we consider the reflex-like arcs involving association tracts from the sensory cortical areas of the thalamus and hypothalamus, and from the frontal cortex to the thalamus and hypothalamus, we are able to postulate the dynamics of the production of emotional tone. If the hypothalamus is over-active to impulses received from the frontal cortex and thalamus, so as to be stimulated and produce a state of fear, we would expect to find an emotionally unstable, fearful individual whose complex deliberate mental processes are distorted by this abnormal emotional tone. On this basis, the breaking of these

so called reflex arcs should bring about at least a partial reduction of the stimulation that was affecting the hypothalamic centres and the patient's fear should be reduced. If a complete break occurs, euphoria may result. We know that removal of both frontal lobes abolishes fear.¹⁰ Inasmuch as the neuro-surgical procedure involves a very small incision in the cortex, little impairment would be expected in the other complex functions in this part of the brain (intellect, judgment, synthesis etc) and as the incision involves approximately 3/5 of the association tracts between the frontal cortex, thalamus and hypothalamus, there still remains a limited connection to permit the conditioning of our emotional tone and thus our behaviour, by the frontal cortical areas and thalamus.

Fig 2, in the top portion, shows schematically the inter-relationship of the various components conditioning our behaviour and it will be seen that incoming sensory impulses are conditioned by thought and feeling, which together allow what we term adaptation, and determine our behaviour or expression. Fig 2, in the lower

FIG 2

ADAPTATION



portion, shows schematically the comparable neuro-anatomical pathways involved in the conditioning of our behaviour or expression. The sensory impulses are received in the parietal areas, from there relayed to the thalamus which in turn has association fibres to the frontal lobe¹¹ and hypothalamus, the hypothalamus in addition having association tracts directly from the frontal lobe. Thus, thought, centred in the frontal lobe areas, and feeling, the result of impulses implemented in the thalamus and hypo

thalamus, are brought together through the association tracts connecting these three areas and determine our behaviour (motor activity) emanating from the pre-Rolandic areas

Fig 3 shows the important fronto-thalamic tract in the inferior portion of the frontal lobe. It will be obvious, as this paper is presented, that what has been set forth above as the possible



Fig 3

Fig 4

Fig 3—From *Functional Anatomy* by Kreis, showing the important fronto-thalamic tract in the inferior portion of the frontal lobe [By permission of the author] Fig 4—Cadaver dissection to illustrate the cut in the white matter of the frontal lobe (A) Tract of brain needle and special cutting instrument (B) Dissection to show cut in white matter of frontal lobe (C) Tip of temporal lobe (D) Orbital surface of frontal lobe

results of this leucotomy, has been demonstrated clinically in the vast majority of patients subjected to the operation. In fact no other demonstrable psychiatric change has been observed as a constant result, other than reduction in the patient's state of fear.

The technique of the destruction of these tracts is such that we do not suggest the exact pathways that have been severed, but are certain that approximately 3/5 of the various association pathways between the frontal cortex and thalamus and hypothalamus are involved in the leucotomy (Fig 4). The afferent pathways passing into the hypothalamus that are concerned in this incision are the fronto-septal, septo-hypothalamic and thalamo-hypothalamic pathways (Fulton)¹³. These tracts are situated in the inferior portion of the white matter of the frontal lobes.

Our interest in bilateral frontal lobe leucotomy was stimulated by Freeman and Watts, and in 1939 we visited Washington and were kindly shown a number of their cases. In 1941 the research unit of the Toronto Psychiatric Hospital embarked upon the psycho-surgical

treatment of hopelessly mentally ill patients. The first patient chosen was a mentally defective female, aged 58, suffering from an involutional agitated depressive state with paranoid features. She had been ill for 2 years previous to the operation, having had a remission of five years' duration from a prior mental illness. At the time of operation, she continually described "little men" who were hammering at her brain and slowly killing her and because of this she felt she would be better dead. There were bouts of weeping and an undercurrent of anxiety which resulted in her pacing about the ward constantly, obviously fearful of what was going to happen. She found it progressively difficult to attend to her toilet habits and she was agitated to the point where she had no appetite. She had lost weight over the period of her illness and at the time of operation her weight was 92 lb. Following a bilateral frontal lobe leucotomy there was an immediate disappearance of her delusions and no discussion in regard to her previous anxiety unless it was initiated by the examiner. At the end of two months she had gained approximately 15 lb in weight. She now was able to help in the care of convalescing patients in a boarding-out home, being limited only by her mental deficiency. In view of this remarkable improvement, 26 patients were subjected to this treatment during the next 5 years.

In the selection of cases, from a psychiatric standpoint, the criterion employed required at least "pathological fear" in the clinical picture. This fear was manifested by anxiety, agitation or impulsive behaviour.

In a number of the patients, insulin shock therapy, as the treatment for schizophrenia, with electroshock therapy as the treatment for catatonic schizophrenia and specifically in depressed mental states, had failed to bring about a maintained improvement. All patients had been ill for more than 2 years with little hope for any significant improvement at any time in the future.

OPERATIVE TECHNIQUE

Preoperative investigation—In the preoperative investigation, particular attention was paid to the cardiovascular system. A complete cardiological examination was performed by a competent cardiologist and the only contra-indication to the operation was a cardiovascular system that was abnormal, due consideration being given to the age of the patient. Such routine investigations as blood examination, renal and liver function tests and car-

bohydrate metabolism tests, etc were fully considered. Investigation was made into the effect of the operation on glucose tolerance and electrocortical activity (electroencephalography), but time does not permit discussion of these features of the research project.

Intra tracheal ether was used as most patients were difficult to handle and local anaesthesia would have been quite inadequate.

Operation—The patient is placed in a semisitting position with the head in a crutch head rest. Scalp incisions are carefully marked out before draping to give exposure of the superior aspect of the frontal lobe just in front of the estimated anterior tip of the lateral ventricle, a pair of burr holes $1\frac{1}{2}$ " apart are made on each side (Fig 5). The upper burr hole on each side is placed about $\frac{3}{4}$ " from the midline, the lower about $1\frac{1}{2}$ " from the upper. The intervening blocks of bone are removed on each side. The dura is opened and an avascular convolution selected. Brain

needles are passed down to the posterior margin of the mid portion of the orbital plates. As the assistant removes a brain needle a special instrument, (Fig 6), is passed through the frontal lobe to the orbital plate. The instrument is then opened, closed, rotated and again opened, then closed and withdrawn (Figs 7 and 8). This procedure is repeated on the other side. The dura is closed, the block of bone and burr hole bone dust replaced. The scalp is closed with a double layer of fine silk.

This technique differs from that employed by Freeman and Watts in that our approach is from above rather than the side, this along with the special instrument appeals to us as a more accurate and safer method than the

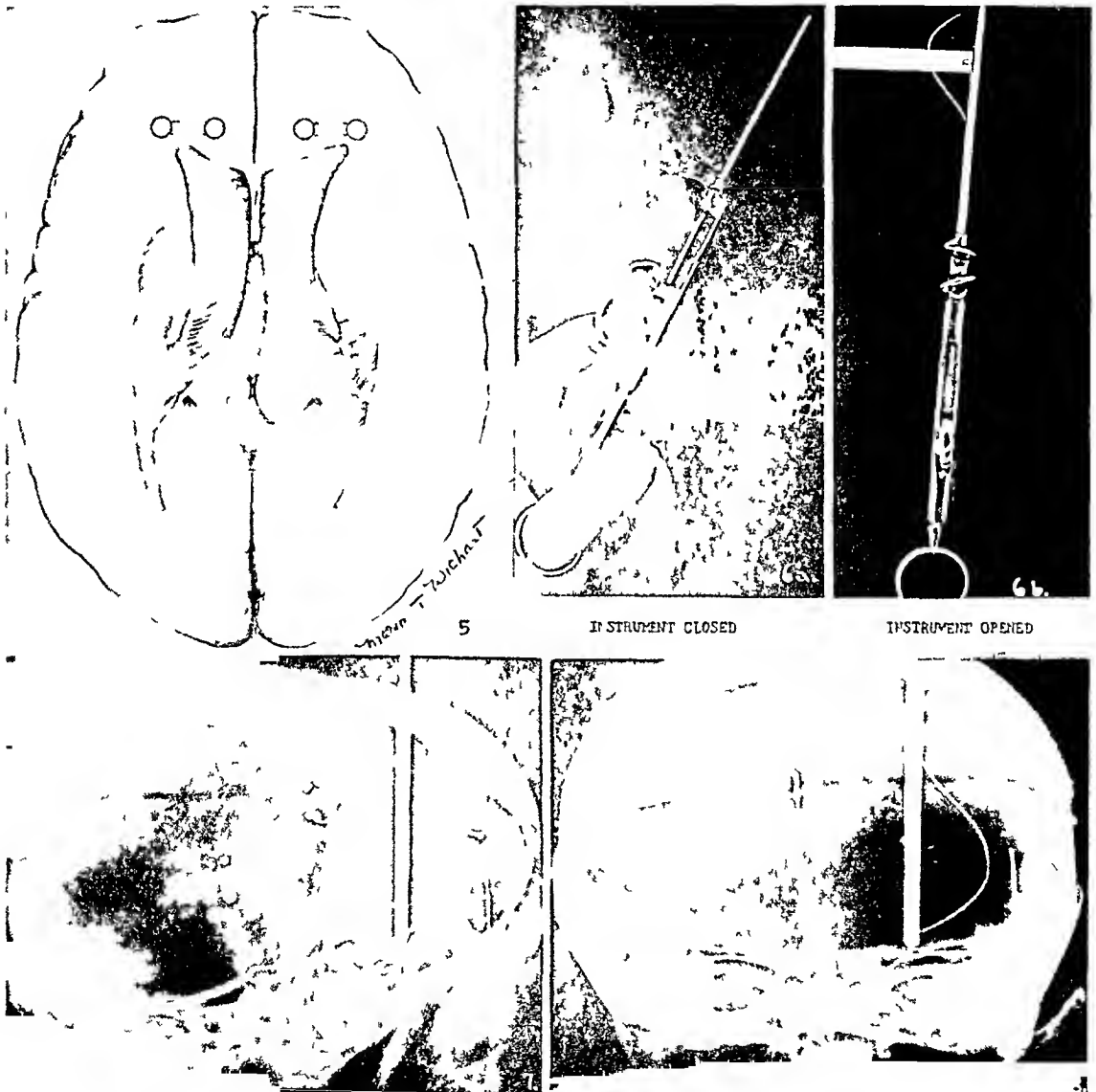


Fig 5—Showing the approximate position of the burr holes in relation to the anterior tips of the lateral ventricles. Fig 6—Showing the special instrument for performing the leucotomy. Fig 7—Showing the special instrument in position. Fig 8—Showing the special instrument open, thus having completed one half of the cut in one lobe. The instrument is closed, rotated and the cut then completed on one side. The procedure is then repeated on the other side.

lateral approach. There is a minimum of cortical injury, none of our patients has developed epilepsy, and no serious hemorrhage has been produced.

Postoperative course—There have been no operative deaths. All wounds healed by first intention, and because of the replacement of bone dust, did not sink in at a later date. The patient usually was able to take solid food within twelve hours and sit out of bed within seventy-two hours. Rapport improves within the first week but it may be a month before the improvement is such that energetic psychotherapy is possible. The outstanding feature in the postsurgical psychiatric care is to determine discreetly the emotional tone attached to the basic etiological agents which previously produced anxiety. When this is determined the patient's previous psychiatric problems can be discussed in completeness and the patient made aware of the fact that their previous attitude towards these etiological agents was at least grossly exaggerated, and reassurance given that as long as this understanding is properly maintained, the problem will not return.

The remainder of the postsurgical psychiatric care consists of the reestablishment of the patient in society, either returning to his household or other employment. As soon as rapport has been established, the social service nurse (who obtained the social history) establishes contact with the patient in order that follow-up visits or inquiries can be made at three or six monthly intervals without undue

concern to the patient. When the patient is able to use his hands, simple occupational therapy is commenced and increased in complexity throughout his stay in hospital.

Complications—The most serious complication following bilateral frontal lobe leucotomy is cerebral hemorrhage, but fortunately this complication has not occurred in this group. There have been no obvious neurological abnormalities as a result of the procedure and the only complication, if it might be called such, has been hypersexuality noticed in 25% of our cases. This difficulty is often seen in neoplasms or other lesions involving the frontal lobes. The complication has not presented a serious feature as it has been manifested by either unusual demands upon the marital partner, or increased masturbation. No anti-social sexual behaviour has been reported referable to the complication, in our series of patients. Usually the increased libido persists for nine to eighteen months, gradually returning to normal. Patients gain from 15 to 50 lb during the six months following the operation.

Results—In Table I is shown the present status of the various patients on whom this operation has been performed. On analyzing our results the outstanding fact is that those patients in whom anxiety was the predominant psychiatric abnormality, showed the greatest degree of improvement and the longest maintenance of their improvement. In the affective group 64% (9 of 14 cases) recovered, allowing their discharge from a mental hospital, and 22% (3 of 14 cases) improved so that the nurse

TABLE I
RESULTS OF BILATERAL FRONTAL LOBE LEUCOTOMY

Diagnosis	No of cases	Average duration of illness	Results*			Percentage improved or recovered
			Failures	Improvements	Recoveries	
<i>Affective disorders</i>						
Manic depressive (depressed)	3	3 years	0	0	3	
Involuntional melancholia	10	4 years	2	2	6	
Schizo-affective (depressive features)	1	20 years	0	1	0	
	14		2 (14%)	3 (22%)	9 (64%)	86%
<i>Schizophrenia</i>						
Catatonic type	6	4 years	1	3	2	
Paranoid type	2	5 years	0	1	1	
Unclassified	4	6 years	1	3	0	
	12		2 (17%)	7 (58%)	3 (25%)	83%
<i>Psychoneurosis</i>						
Anxiety state	1	3 years	0	0	1 (100%)	100%
	27		4 (15%)	10 (37%)	13 (48%)	85%

Complications—Mild hypersexuality—7 cases (3 female, 4 male) (25%)

* Recovery indicates ability to carry on independently outside of mental hospital

TABLE II
SYNOPSIS OF CASES SUBJECTED TO BILATEPAL FRONTAL LOBE LEUCOTOMY

<i>Patient</i>	<i>Age</i>	<i>Diagnosis</i>	<i>Duration of illness</i>	<i>Preoperative mental state</i>	<i>Time since operation</i>	<i>Present mental state</i>
1 E, F (F)	51	Manic depressive psychosis (depressed features)	6 years	Depressed, untidy and fearful	19 mos	Complete recovery
2 DeL, J (F)	54	Manic depressive psychosis (agitated phase)	4 years	Extremely agitated and fearful	36 mos	Complete recovery
3 H, G (F)	54	Manic depressive psychosis (depressed phase)	2 years	Depressed, agitated and fearful Inaccessible	43 mos	Improved Able to be with family Seclusive, definite psychomotor inertia
4 W, J (F)	58	Involuntional melancholia (paranoid features)	2 years	Fearful because of paranoid hallucinations	48 mos	Improved Able to help in boarding home until appearance of carcinoma Died 2½ years following operation for carcinoma of breast
5 F, T (M)	64	Involuntional melancholia	3 years	Depressed with periods of agitation	54 mos	Improved Able to be home but childish behaviour now suggests senile mental changes
6 O, L (F)	55	Involuntional melancholia	5 years	Agitated, resistive, and fearful	25 mos	Complete recovery
7 F, D (F)	57	Involuntional melancholia	6 years	Extremely agitated, fearful and resistive	31 mos	Recovery Able to manage household but shows emotional instability that may be constitutional
8 G, J (M)	60	Involuntional melancholia	3 years	Agitated, ill kempt, hallucinated	12 mos	Unchanged
9 H, M (F)	51	Involuntional melancholia	4 years	Agitated, ill kempt, impulsive, showing flight of ideas and copramania	36 mos	Unchanged
10 C, M (F)	60	Involuntional melancholia	8 years	Extremely agitated, almost to the point of physical exhaustion Inaccessible	12 mos	Improved for 9 mos then physical state deteriorated and mentally patient relapsed Died of chronic myocarditis
11 G, J, J (M)	69	Involuntional melancholia	5 years	Irritable at times apathetic with marked psychomotor inertia Physically deteriorated	41 mos	Improved for 2 yrs remained somewhat cantankerous and signs of senile mental changes appeared
12 P, A (F)	60	Involuntional melancholia	2 years	Obsessed with idea of sin, agitated, untidy with bouts of weeping	4 mos	Complete recovery
13 A, E (F)	60	Involuntional melancholia	5 years	Extremely anxious, to the point of agitation Hypochondriacal and fearful	38 mos	Improved
14 J, A (M)	52	Schizo-affective	20 years	Periods of manic behaviour alternated with periods of marked psychomotor inertia, when patient was completely inaccessible	37 mos	Improved for 1 yr when able to be on working parties but relapsed and now agitated, hallucinated and untidy
15 B, R (F)	31	Schizophrenia (Catatonic type)	4 years	Agitated, hallucinated and impulsive	42 mos	Recovered, only mental abnormality is facetious, superficial behaviour

Patient	Age	Diagnosis	Duration of illness	Pre-operative mental state	Time since operation	Present mental state
16 H,R (M)	23	Schizophrenia (Catatonic type)	4 years	Catatonic with periods of agitation and possible depressive features	50 mos	Improved Able to be out of hospital but still immature, superficial behaviour and requires continual supervision by family
17 V,A (M)	35	Schizophrenia (Catatonic type)	9 years	Mute catatonic, destructive and impulsive	30 mos	Improved for sporadic intervals during first six months, able to work around hospital grounds then relapsed to former mental state
18 A,G (M)	23	Schizophrenia (Catatonic type)	2 years	Impulsive, periods of acute catatonia Mute, resistive, personal habits filthy	52 mos	Improved Has had 2 short relapses requiring mental hospital care At present at home, but unable to hold a job for longer than several months at a time Wanders from home, spends money foolishly
19 I,B (M)	21	Schizophrenia (Catatonic type)	5 years	Seclusive, marked psychomotor inertia, posturing, etc	53 mos	Unchanged
20 R,S (M)	46	Schizophrenia (Catatonic type)	7 years	Extremely fearful because of imaginary people who planned to harm him Seclusive with marked psychomotor inertia	1 mos	Improved Able to return home on probation, is slightly euphoric but no longer fearful
21 K,A (M)	36	Schizophrenia (Paranoid type)	5 years	Agitated, untidy, violent seclusive, apathetic	47 mos	Complete recovery
22 J,A (F)	39	Schizophrenia (Paranoid type)	5 years	Unco-operative, resistive, negativistic with paranoid delusions and hallucinations	47 mos	For 3 yrs co-operative, tidy, contented, then relapsed, now inaccessible, talks in meaningless fashion, hallucinated
23 G,E (M)	32	Schizophrenia (Unclassified type)	12 years	Impulsive disoriented, fearful hallucinated, untidy, incoherent	12 mos	Improved Able to be home, shows interest in occupational therapy, sports and personal appearance Still superficial and unable to get along without 24 hour supervision by family
24 P,J (F)	21	Schizophrenia (Unclassified type)	3 years	Silly, superficial behaviour, hallucinated, impulsive, unco-operative	8 mos	Improved Able to live with family, silly behaviour still present, no further impulsiveness
25 B,J (M)	22	Schizophrenia (Unclassified type)	3 years	Sullen, periods of marked psychomotor inertia untidy, grandiose ideas	12 mos	Improved for 6 mos, able to study Sr Matriculation subjects Then relapsed for 3 mos Past 3 mos improved, able to be with family on farm Unable to adapt to group activity
26 H,D (M)	36	Schizophrenia (Unclassified type)	5 years	Psychomotor inertia, delusions as to sin, agitation, periods of apathy, suicidal tendencies	14 mos	Unchanged
27 Q,F (F)	53	Psychoneurosis (Anxiety state)	3 years	Fearful and restless	6 mos	Complete recovery

ing problem was significantly decreased. A total of 85% (12 of 14 cases) in this group therefore benefited from this therapeutic procedure. In the schizophrenic group, 25% (3 of 12 cases) recovered and were discharged from hospital and 58% (7 of 12 cases) were improved nursing problems. It is obvious, therefore, that the improvement in this group was not as complete as in the affective disorders. It is of interest to note that approximately the same percentage, 86% in the schizophrenic group, showed a significant improvement in behaviour following operation, but the percentage discharged from hospital differed widely in the two groups (64% in the affective as compared to 25% in the schizophrenic). In the one case of psychoneurosis, an anxiety state, a complete recovery was made and has been maintained for the past seven months. The two failures in the affective group were cases of involutional melancholia in whom obvious mental deterioration had taken place. In the schizophrenic group, one failure was a case of catatonic schizophrenia with obvious mental deterioration. The patients in whom mental deterioration was apparent, as manifested by reversion to primitive types of behaviour, were automatically excluded from the series, following failures in three such cases. The remaining failure, a case of schizophrenia of the unclassified type, could not be attributed to deterioration. The series consisted of 14 females and 13 males whose ages ranged from 21 to 69 years.

Table II is a case synopsis of our series. It is noteworthy that in this small series of 27 cases, assuming that the average life of a patient would be 65 years and that the patient would require mental hospital care for the remainder of his life, this neurosurgical procedure has saved an expenditure of approximately \$70,000 (calculated on a basis of 230 hospital years at \$300 per year). This saving could be increased many fold if facilities were available to select suitable candidates and to provide medical, surgical and nursing care for this procedure.

PSYCHOLOGICAL TESTS

Approximately 20 of the patients in our series were subjected to the following battery of psychometric tests before and after leucotomy: Kent-Rosanoff word association test, Healy pictorial completion test, progressive

matrices, Stanford-Binet or Wechsler-Bellevue orientation memory test, attitude scale.

By this means, some of the complex functions of the cerebral cortex could be evaluated, but in the majority of cases such evaluation was only possible following the operation, as preoperatively the patient was inaccessible. We can state that by the above tests there was no significant gross defect in the patient's intelligence following the operation but orientation and memory were impaired slightly for a period varying from several weeks to several months postoperatively. We feel there is a real need for the development of better means of testing a patient's capabilities before and after operation as we appreciate the limitations of our above tests. Halstead⁷ has reported at the 1946 convention of the American Psychiatric Association, a method by which better assessment can be made of the patient's capabilities following bilateral frontal lobe leucotomy. Further observations will take place in this regard as our series increases.

SUMMARY AND CONCLUSIONS

We have presented a series of 27 cases in which there has been a mental illness lasting for more than an average of 3 years and in which all other recognized psychiatric therapies were employed to no avail. A common clinical finding in this series was that of fear, agitation or impulsive behaviour. In the combined group, approximately 85% of the cases have shown improvement ranging from improved nursing problems to complete recoveries. Thirteen of 27 patients, who were previously considered to be hopelessly mentally ill, have been returned to community life. The only complication observed is that of a mild hypersexuality in 25% of the cases. In our opinion, this neurosurgical procedure offers a valuable addition to our therapeutic armamentarium in the treatment of what previously would have been considered hopelessly mentally ill patients.

The investigation reported in this paper was in part supported by grants from the Rockefeller Research Foundation and was carried out in the department of psychiatry of the University of Toronto. The nursing and hospital facilities were made available by the Department of Health, Province of Ontario. The authors are deeply indebted to Professor C. B. Farrar for his assistance and direction in this project. We wish to express our appreciation of the co-operation of the superintendents of the various Ontario Mental Hospitals from which patients were made available for this treatment, to the Toronto General Hospital for providing facilities for the neurosurgical procedure and to the Toronto Western Hospital for providing private re-

accommodation for patients of that category Miss Helen Algie, R.N. has been of great assistance in the collection of follow up data

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CANCER OF THE PROSTATE

(An Eleven Year Survey at the Toronto General Hospital)

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CARCINOMA of the prostate usually arises in the posterior lobe of the gland, well away from the urethra (Fig 1). For this reason, in the early stages of the disease there are no symptoms. The growth, however, may be readily felt by palpation through the rectum.

A patient with cancer of the prostate can be cured by total prostatectomy in the early symptomless stages, while the tumour is still within the capsule of the gland, provided there are no metastases. If the growth has spread beyond the confines of the prostate the patient is incurable by any known method of treatment.

Since the disease in this early stage has no symptoms, it can only be found by routine

examination. It is, therefore, imperative that a careful rectal examination be made on every male over fifty years of age who presents himself for routine "health examination" or "annual overhaul". It is important that every medical man be familiar with the "feel" of early prostatic cancer. A small hard nodule with ill defined margins felt in the prostate on palpation per rectum should be regarded with grave suspicion. The nodule may be either an early cancer, a fibrous nodule resulting from chronic prostatitis, or a pocket filled with small calculi.

Chronic prostatitis, which has undergone fibrosis, produces a gland which feels granular rather than nodular, and nodes produced by calculi tend to be sharper and better defined than cancerous nodules.

It is often difficult to make a decision on one examination. For this reason it is wise to have the patient return in a couple of weeks and, if one cannot convince oneself that the node is definitely not a carcinoma, the problem should be explained to the patient; he should be admitted to hospital (serum acid and alkaline

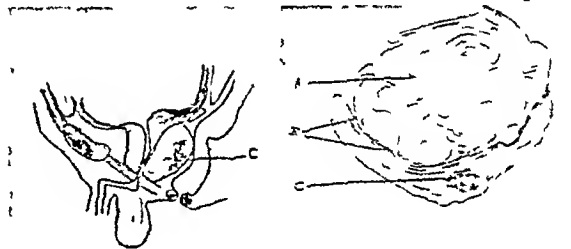


Fig 1—Diagram showing site of early cancer, adjacent to rectum remote from urethra. Fig 2—Diagram showing "A" adenoma "C" nodule of cancer in thinned out prostate gland "B" line of cleavage followed by the finger when suprapubic enucleation is done

phosphatase estimated) and prepared for perineal prostatectomy. The gland is then exposed by the perineal route. The nodule is excised without opening the urethra and a fresh biopsy done. Should the report be negative the incision is closed and the patient leaves hospital in a week. If the sections show cancer cells one proceeds with a radical prostatovesicectomy, with good prospects of curing the patient.

Early symptomless, curable cancer of the prostate may accompany an adenomatous enlargement of the gland which is causing some frequency and difficulty. Unfortunately,

* Read at the Seventy seventh Annual Meeting of the Canadian Medical Association, Section of Urology Banff, Alberta, June 12, 1946

the popular fallacy that it is normal for a man "getting on in years" to have to get up at night to urinate, delays the time when the patient seeks advice, until the cancer itself is beyond removal. The nodule is felt on rectal examination between the adenomyoma and the rectal wall.

It is important to realize that the cancer is not in the adenomyoma, but in the thinned-out prostate, which forms the so called false capsule of the larger (benign) tumour, and will not be removed by the operation of suprapubic enucleation, which is commonly but erroneously called prostatectomy. Fig 2 illustrates what is achieved by this procedure. The patient will get a satisfactory immediate result, but the residual carcinoma will progress to an inoperable stage in an average of three or four years.

Obviously, such a case, if the nodule is small, should be treated by a perineal operation, the suspicious nodule sectioned and then either enucleation of the adenomyoma or total prostatectomy proceeded with according to the pathologist's report.

Unfortunately, the majority of patients come for treatment in the later stages of the disease with either symptoms from obstruction or metastases or both. There is no known cure for such a patient. However, bio chemical research has provided treatment which will, in the majority of cases, for a limited time retard the progress of the disease and relieve the pain of metastasis to bone.

Various phosphatases are present in the blood and other body tissues, but the adult prostate of man and monkeys is extraordinarily rich in a phosphatase having an optimum activity at a pH of 2.5, which originates in the acinar epithelium of the gland.

This "acid" phosphatase is present in large quantity in carcinoma of the prostate (unless the carcinoma be of the undifferentiated type) both in the local and metastatic tumours. The enzyme escapes from the tumour into the lymph and blood channels, thereby raising the "acid" phosphatase of blood serum.

The normal range of "acid" phosphatase in the serum is the same in men and women, 0.5 to 2.5 King Armstrong units per 100 cc of serum. It is elaborated mainly in the kidney, spleen and liver. There is also a phosphatase in the red blood corpuscles, having a maximum

activity at pH 6.0, but retaining some activity at lower levels, therefore, a reading from serum where some haemolysis has taken place may be misleading.

Gutman and Gutman found the acid phosphatase level normal in over 90% of 853 men who had no apparent prostatic disease. It was normal in 100% of 75 men suffering from adenomyoma of the prostate, and normal in 90% of 70 patients who had carcinoma of the gland without demonstrable metastases. The serum acid phosphatase was raised in 85% of 177 cases of carcinoma of the prostate with metastases.

With these facts in mind Huggins theorized as follows. Immature prostatic cells contain negligible amounts of enzyme, adult prostatic epithelium contains a large amount, cancerous cells of prostatic origin also contain a large amount of enzyme. We know that normal mature prostatic epithelium can be made to atrophy by reducing the amount or neutralizing the effect of androgenic hormone in the body. Perhaps it is possible to produce atrophy of malignant prostatic epithelium by castration or administration of oestrogens (Gutman).

Since 1941 when Huggins and his associates published their first clinical results, a vast number of patients have been treated in many clinics with varying success. The reason for failure in some cases is obvious, the carcinoma is found to be undifferentiated, it is not the same biological entity as the common type of prostatic cancer, and therefore cannot be expected to react in the same way to the same physiological stimulus.

The result following bilateral orchiectomy on a patient with obstruction and pain from metastases is very striking. In twenty-four to thirty-six hours the pain has gone, in a week or so the patient is voiding more freely. Occasionally a patient with previous complete retention will void down to a residual of three or four ounces. X-ray examination of the osseous metastases will show a return to more normal bone structure in two to three months.

The serum acid phosphatase shows an immediate drop towards normal level, and the alkaline phosphatase (pH 9.0) shows an initial further rise and then a slower recession.

The relief from adverse symptoms is more marked as regards the metastases than the local tumour. Many cases require transurethral re-

section in spite of orchidectomy. It is, however, good practice to do the orchidectomy first and carry the patient along with the aid of an indwelling catheter for a week or ten days until the cachexia is under control and the patient better able to withstand the more major operation.

The same chain of events may occur when a similar patient is put on stilbæstrol, but with either treatment the results may be much less striking. Only of one thing can we be sure, namely that the disease will sooner or later reactivate and claim its victim. No man has ever been cured by this treatment. Patients who run a long course before relapse have been aptly termed by Heiger and Sauer² "delayed failures"; and these authors have noted that "the phosphatase does not climb again in proportion to the progress of the disease." Laboratory results must, therefore, be discounted by clinical findings.

Why these patients relapse is not known. Perhaps a second endocrine substance is needed to enhance the action of an intermediary gland.

Androgens are produced in the testes and adrenals. Possibly after orchidectomy the adrenals acquire a compensatory androgen activity, thereby reactivating the cancer. In this case combined treatment by orchidectomy and stilbæstrol should achieve better results than either one alone. Experience does not support this conjecture. In reviewing personal cases we are more struck by the bizarre results obtained than by any uniformity in the reaction of the disease in patients submitted to the same treatment. Judgment is apt to be influenced by a few good results in personal cases, hence one clinician will advocate immediate orchidectomy, and another will say no, give stilbæstrol first and when the relapse occurs you still have orchidectomy to fall back on. The argument either way is thin. More androgen and oestrogen research in the male is needed.

Since the epididymis is not concerned in the production of androgens, it is only necessary to remove the bodies of both testes, replacing the cords and epididymis in the scrotum. This operation can be done through a one inch incision over each external inguinal ring. The presence of something in the scrotum pleases the patient, of course the epididymis atrophies in three or four months, but by that time the patient is reconciled.

The dosage of stilbæstrol is empirical, and it would seem to us reasonable to base it on physiological reaction. Our practice is to give two milligrams three times daily by mouth, and reduce the dose only if the breasts become excessively sore. We have seen patients with pain unrelieved by two milligrams per day obtain relief when the dose was increased. One patient, who had no relief with a daily dose of six milligrams of stilbæstrol by mouth, obtained relief by the addition of two milligrams of diethylstilbæstrol dipropionate by hypodermic each day for ten days, after which the six milligrams of stilbæstrol per day by mouth controlled the pain for several months.

Some patients are nauseated or depressed by stilbæstrol, and the drug should be changed to diethylstilbæstrol dipropionate. There are one or two more synthetic oestrogens on the market of which we have had no personal experience.

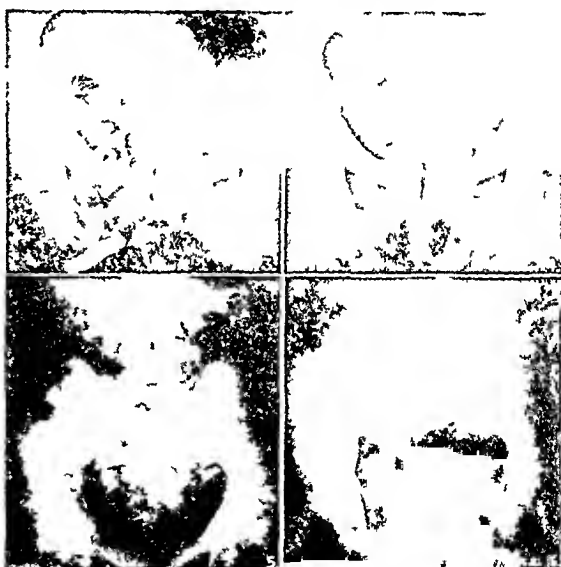


Fig 3—X ray film showing almost total destruction of the left ascending pubic ramus, secondary to carcinoma of the prostate. Fig 4—Repeat film one year later showing regeneration of the bone following stilbæstrol therapy. Fig 5—Film showing extensive involvement of lumbar vertebrae and pelvic girdle. Fig 6—Repeat film one year after bilateral subtotal orchidectomy.

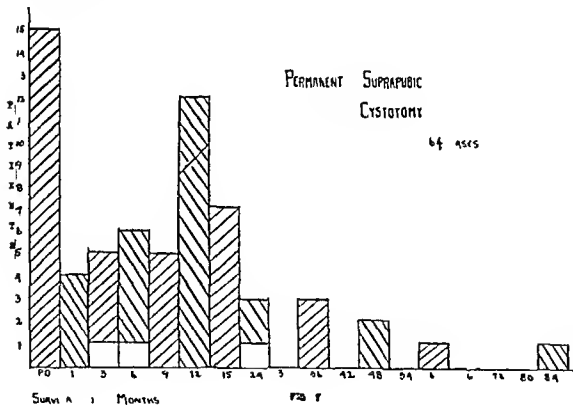
The value of any particular treatment for an incurable disease should be considered from two points of view. First, does it render the patient less miserable? Second, will it prolong his life? Oestrogen therapy does both with the emphasis on the first consideration. It must, however, be remembered that some cases live from four to ten years without any treatment. Metastases

are not a factor in these patients. They die from uræmia due to obstruction of the intramural portion of the ureters following invasion of the floor of the bladder by direct extension of the growth. Intestinal obstruction may also occur from spread of the carcinoma along the rectovesical layer of the pelvic fascia.

At the Toronto General Hospital during the years 1935 to 1945 inclusive, 310 patients with carcinoma of the prostate were submitted to various operative procedures with the results shown on the accompanying graphs. Any patient, who did not survive for four weeks, has been called a postoperative death.

Series 1 Permanent suprapubic cystotomy 64 patients, roughly 23%, died in the first month, 45% survived one year, but only 15% survived two years. One patient lived seven years.

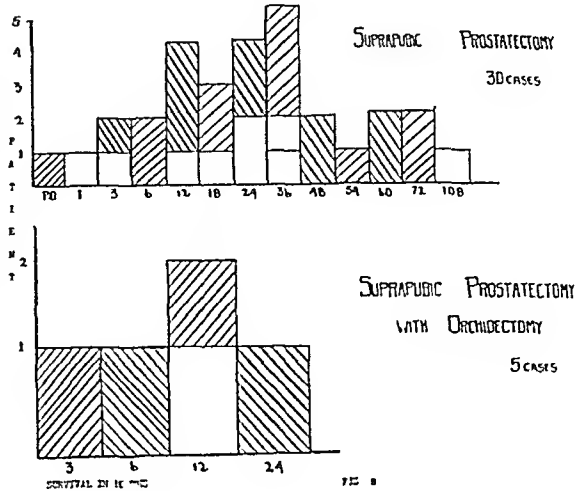
This operation is rarely done now. The tube requires at least daily irrigation, preferably with half strength "G" solution to deter infection with urea splitting organisms, which renders the urine alkaline and accelerates plugging of the channel with urinary salts making frequent changing necessary.



Series 2 Partial suprapubic prostatectomy 35 patients, one died in the first month, 77% survived one year, 51% two years, 37% three years, 23% four years, and one patient is still alive, taking stilbestrol at nine years. Five patients in this series also had orchidectomy performed, only one of these five survived two years.

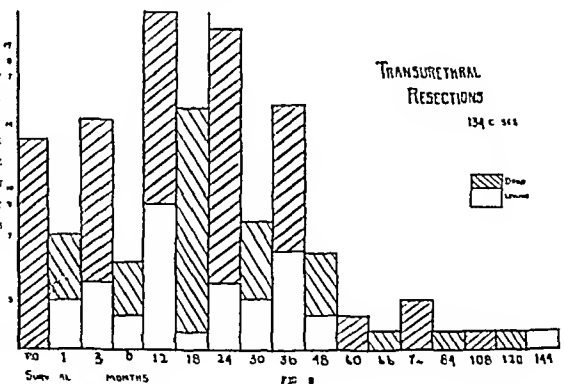
Patients in this group were in better physical condition at the time of operation than those in series 1, hence the lengthened survival. The operation is not recommended. Transurethral resection gives as good functional results with less risk.

Series 3 Transurethral resection 134 patients, 13 died in the first month, 70% survived one year, 44% two years, 23% three years, 12% four years, six patients for six and one patient for twelve years. Many of these patients were in poor physical condition at the time of operation.



Series 4 Transurethral resection and orchidectomy 38 patients, 2 died in the first month, 70% survived one year, 50% two years, 34% four years, and one patient is still alive at nine years.

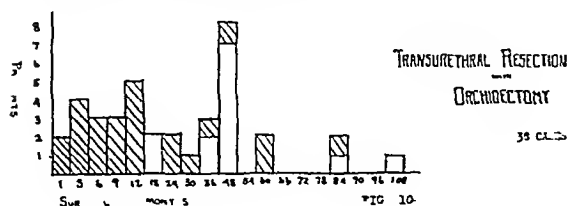
Series 5 Orchidectomy only 20 patients, 2 died in one month, 60% survived one year, 30% two years. Three patients survived three years.



and two, of whom one is still living, survived four years. Most of these patients had considerable pain from metastases and little or no urinary obstruction.

Series 6 Perineal subtotal prostatectomy 7 patients, 3 died in the first month, 4 survived one year, 3 for eighteen months and two patients, one of whom is still alive, survived four years. This latter patient also had orchidectomy.

Series 7 Perineal total prostatic-vesiculectomy 12 patients The first death occurred at six months, 7 patients survived one year, 4 patients three years and 3, of whom one is still alive, four years One of the year survivors, now dead, had also orchidectomy



able hope of curing early cases by perineal prostatic-vesiculectomy In advanced cases oestrogen therapy is at present the best palliative treatment When obstruction is a factor, transurethral resection should be done Whether orchidectomy is to be preferred to stilbæstrol is a matter for further research

We are indebted to the follow up service of the Toronto General Hospital for sending out the questionnaires in this study

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THE ABSORPTION OF ENTERIC-COATED AMMONIUM CHLORIDE

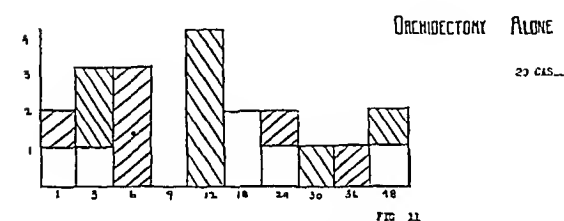
By Frances L Selye, M D

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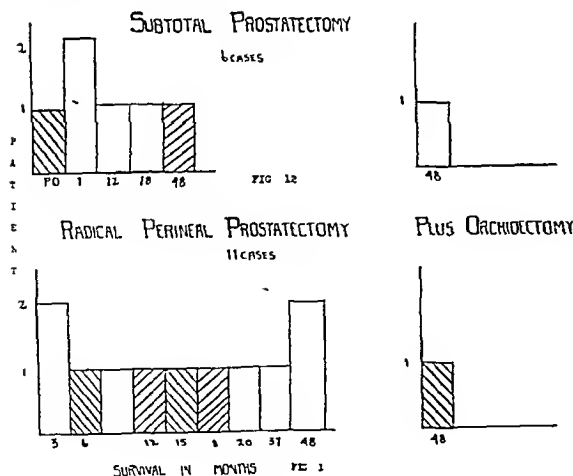
IN view of the work of Selye and his collaborators¹ on the prevention of experimental hypertension and nephrosclerosis in animals by acidifying drugs (ammonium chloride calcium chloride, etc) we felt that clinical trial of this principle should be attempted Ammonium chloride was employed since it had been used so extensively as a diuretic and is non-toxic Six to eight grams daily in divided doses of the ordinary commercially available enteric coated tablets were given

After some months of work with varying results one patient was sent to the x-ray department for a test of gall-bladder function, and in the course of examination many opaque tablets were noted in her large bowel, even in what appeared to be her sigmoid colon (Fig 1) From that time a point was made of asking other patients whether they had noticed any tablets in their stools Of 55 patients 4 others said they had seen such undigested tablets for some time, but had not thought of mentioning it

At about the same time a patient with malignant hypertension was admitted to hospital whom we were very anxious to treat rapidly due to the seriousness of his condition We administered 8 gm q d (16 tablets each 0.5 gm) and noted no effect on his blood pressure after a week although three stool specimens had been carefully checked for tablets and none found It then occurred to us to recheck his



Two patients, who are apparently free from disease, were operated upon in the past three months Only recently has more than an occasional case come early enough to perform complete excision The histological sections show that some of the cases in this series should be among the subtotals



CONCLUSIONS

The prostate ranks third in frequency as the site of cancer in the male, being surpassed only by the skin and gastro-intestinal tract Cancer of the prostate is an insidious disease with no symptoms in the curable stages It must be searched for by routine examination, aided if necessary by perineal biopsy There is a reason-

CO₂ combining power which had previously been high (72.1 and 67.9 vol %), and which according to all investigators^{2, 3, 4} should have been appreciably reduced on this dosage after several days. It was, however, 62.9 vol %, on the 10th day after the beginning of treatment from which we were forced to conclude that he had absorbed little or none of the



Fig 1

administered drug. Subsequently, a gastric analysis was done showing an achlorhydria on three specimens, a finding which we thought might have accounted for the non absorption, although theoretically this should have no bearing on the problem since enteric coatings are usually fatty acid esters and are chosen for their resistance to hydrochloric acid, dissolving in the alkaline pH of the small bowel.

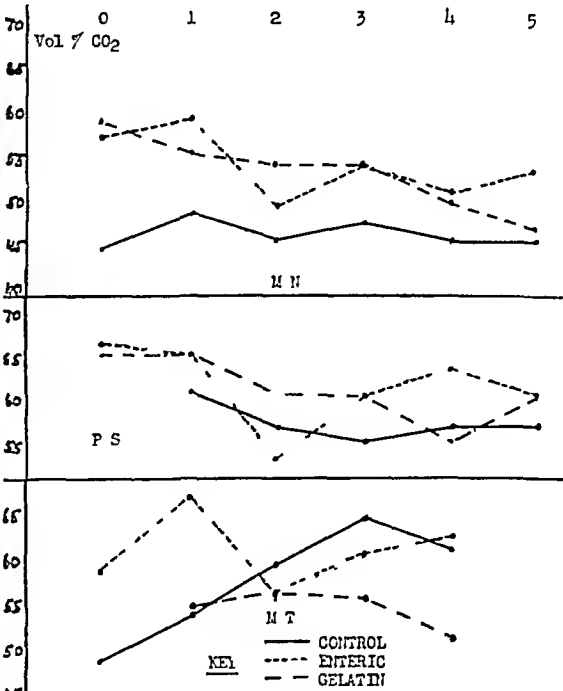


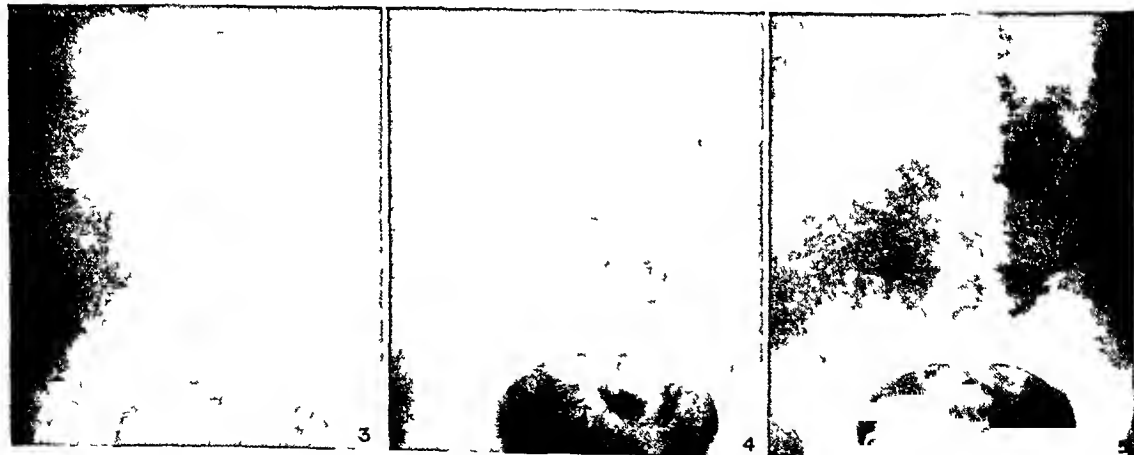
Fig 2

He was then given ammonium chloride in gelatin capsules which he tolerated well and later he was given some tablets made especially for us,* which were heavily coated with gelatin and had only an extremely thin resinous film. On these he showed an appreciable acidosis compared with his previous levels (CO₂ combining power of 51.8, 59.5, 51.9, 50.3 vol %) and he also showed a concomitant clinical improvement.⁵

EXPERIMENTAL

We felt that some effort must be made to establish whether this non absorption was frequent and whether there was a method for its

* Daltol (Frank W. Horner, Ltd., Montreal)



detection Accordingly we gave 5 gm ammonium chloride at one dose to three healthy adults and followed a 5 hour CO₂ curve, hoping that we could establish some constant change in a short period of time which would indicate absorption Hastings⁶ had shown an irregular CO₂ response even in doses up to 15 gm on a short term curve, but we had hoped that there would be enough change to use this as a gross method, since blood pH determinations (which they had showed to be a sensitive and immediate indication) were beyond the facilities of most clinical laboratories The three curves in Fig 2, represent (1) no treatment, (2) enteric-coated tablets, and (3) gelatin-coated tablets (dalitol) It can readily be seen that there was no constant and appreciable change

Accordingly we repeated the ammonium chloride administration in the two types of tablet and followed the fate of the tablet directly by x-ray Figs 3, 4 and 5, are the plates of the patient MN whose blood findings were recorded above In Fig 3, we see enteric-coated tablets in the small bowel unchanged at 2½ hours In Fig 4, are seen the gelatin-coated tablets at 5 min after ingestion and in Fig 5 the absence of the latter tablets at 2 hours

Similar sets of x-rays were taken on three other healthy young people with the same results In order to demonstrate whether there was perhaps absorption later than the arbitrary

TABLE I
3f

	Pre treatment	Post treatment
HD	54.1 vol %	61.8 vol %
PS	56.3 vol %	51.5 vol %

chosen 2½ hours' interval, two healthy adults received 7 gm qd for 4 days and at the end of this time CO₂ combining powers were in the same range as before treatment (Table I)

DISCUSSION

In view of the widespread use of ammonium chloride as a diuretic as well as its potential use in hypertensives we feel that the use of enteric-coated tablets is, at best, unpredictable We can only say that with the tablets finally used by us we noted gastric discomfort in only

2 out of 60 and in these patients the drug was administered successfully in the usual enteric coated tablet Absorption occurred in all cases

One of the two healthy persons taking the enteric-coated tablets for 4 days, noted constipation, a symptom often ascribed to the use of ammonium chloride At x-ray some, though not all, tablets which had been taken as long as 28 hours before were seen to be undigested, suggesting that constipation may be entirely on an obstructive foreign body basis rather than a pharmacological effect of the salt The other person noted intestinal cramps, and she had on previous occasions taken equal doses of untreated pure salt which had not caused this effect although it had given some immediate epigastric burning These incidents suggest that we must differentiate symptoms occurring from the preparation of the drug from those due to the drug itself

CONCLUSIONS

- 1 In a small percentage of cases enteric-coated ammonium chloride tablets pass unchanged through the gastro intestinal tract
- 2 In a larger percentage of cases, and in both healthy young adults tested, prolonged administration of such tablets results in no acidosis although the tablets are destroyed before excretion, presumably at a level too low in the intestinal tract to allow effective absorption
- 3 Ammonium chloride when administered in a gelatin-coated tablet is invariably absorbed and only rarely not well tolerated

We wish to thank F W Horner, Ltd, for their preparation of the ammonium chloride tablets and the Department of Radiology of the Royal Victoria Hospital for their kind co operation

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OBSERVATIONS ON THE SPRUE SYNDROME

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SPRUE is a disease characterized by steatorrhœa, wasting and anæmia. Its symptomatology has been recognized for centuries, but it is only within the past few decades that its true nature has been elucidated by careful and controlled investigation.

In 1888, Samuel Gee¹ described the "cœliac affection" distinguished by steatorrhœa and cachexia. He recognized it as a disease of both childhood and adult life and described a form of dietary therapy. He expressed no view as to its etiology.

In 1935, Rhoads, Castle *et al*² published the results of a large series of cases studied at Puerto Rico. Their conclusions placed the pathogenesis of sprue in the same general class as that of pernicious anemia. This concept was based on (1) Involvement of identical systems, *viz*, gastro-intestinal, hæmatopoietic and nervous; (2) The occurrence of identical macrocytic anemias, and (3) the presence of a similar megaloblastic proliferation of the bone marrow.

These impressions were further strengthened by their observations that (a) The alimentary and hæmatological manifestations of sprue were benefited by liver extract; (b) Sources of the "extrinsic factor" were beneficial in sprue only after contact with human gastric juice; (c) The liver of a patient who died of sprue was found to contain no detectable amount of cythocyte maturation factor.

This interpretation appeared to afford a satisfactory explanation of all phases of the problem. Nevertheless, in 1942, Huist³ published a concept of the etiology of sprue which was at direct variance with that of the above workers. This article suggested that the underlying basis of this syndrome was a widespread paralysis of the muscularis mucosæ of the small bowel and its extensions into the intestinal villi. Such paralysis was stated to result in the cessation of the normal pumping action of the villi, and consequent impairment of the absorption of fat. This hypothesis explains satisfactorily the radiographic findings but fails to satisfy other phases of the problem. The interpretation advanced by

Rhoads and Castle is generally considered to be the more rational.

Huist's contribution, however, was that of classifying the various terminologies, *viz*, "tropical sprue", "non-tropical sprue", "cœliac disease", "idiopathic steatorrhœa" and "chronic jejuno ileal insufficiency" into one common entity which he designated as "the sprue syndrome". In 1944, Hanes⁴ crystallized the diagnostic criteria in sprue without attempting to add to our views as to its causation. In the same year, Moore, Vilter, Minnich and Spies,⁵ brought the nutritional macrocytic anemias of avitaminosis into the same category.

Following the isolation of the lactobacillus casei factor and folic acid, and the demonstration of their efficacy in pernicious anemia it was natural that these results should be applied to the treatment of sprue and very recently Darby, Jones and Johnson⁶ have shown that the L. casei factor is effective in the sprue syndrome.

It would appear to us that chronic diarrhœas with impairment of fat absorption, secondary to mechanical derangements of the bowel should logically fall within the boundaries of the sprue syndrome. Experience has shown that such

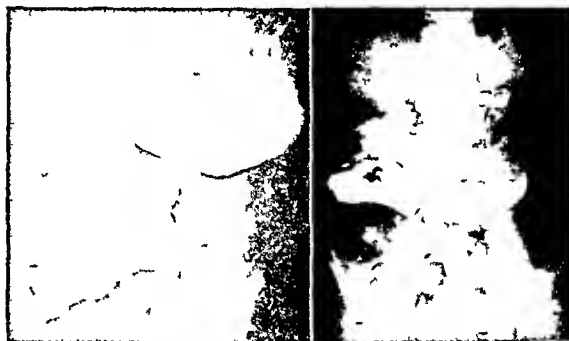


Fig 1

secondary cases may develop both gastrointestinal and hæmatopoietic disturbances in varying relative degrees, indistinguishable from those of primary sprue. We submit that if this view is accepted the terms 'primary' and 'secondary' sprue may well be employed as an etiological distinction. Huist's case of sprue syndrome from obstruction of the lacteals by chronic tuberculosis of the mesenteric lymph nodes is a case in point.

Diagnosis—The diagnostic criteria, modified from Hanes (*vis*) are as follows:

- 1 Steatorrhœa—in the absence of which a diagnosis of sprue may not be made.
- 2 Weight loss—which follows naturally on the preceding feature, and may be more marked than in almost any other wasting disease.

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3 Flat glucose tolerance curve—this phenomenon is considered to be the result of impaired carbohydrate absorption and is a relatively constant though not pathognomic finding

4 Macrocytic anaemia—it is inherent in the modern view of the pathogenesis of the sprue syndrome that macrocytic anaemia be a relatively constant finding in this disease

5 Hypochlorhydria and achlorhydria—these disturbances of gastric secretion frequently occur, but there is no such constancy in the finding of absolute achlorhydria as occurs in pernicious anaemia. In doubtful cases, therefore, the presence of even a minimal degree of free acidity may be of high diagnostic value

6 Radiologic abnormalities. These include (a) loss of the usual feathery pattern of the small bowel mucosa with its replacement by a coarser pattern, or with the entire disappearance of pattern, the latter being known as the "Moulage sign"; (b) the separation of the barium in the small intestine into dilated, bag like or sausage shaped clumps, of various lengths, and with smooth contours

7 The presence of excess of total fat in the stools with normal proportion of split fat. This may be recognized by microscopic examination of the stools or by the more laborious but highly accurate chemical estimation of neutral fats and split fat (fatty acids and soaps)

We consider that practically all cases may be recognized by consideration of the criteria herein outlined. It should be stressed that the absence of one or more of these findings does not prohibit a diagnosis of this syndrome if the remaining features are sufficiently convincing. Other physical findings such as glossitis and cutaneous manifestations, are frequently noted but are not considered diagnostically obligatory.

TREATMENT

The present conceptions as to etiology direct the treatment into rather obvious categories. These are

1 Dietary—Since the presenting symptom of steatorrhoea is the result of deficient fat absorption, treatment is directed towards supplying the calorie requirements by protein and carbohydrate alone. A diet high in these elements and free of fat is therefore indicated. In long-standing cases, the small bowel may temporarily lose most of its capacity for absorption, and in such cases, an initial period of parenteral therapy may be necessary. For this purpose the newer split-protein products have been found to be admirably suited. As treatment progresses, the bowel usually regains its ability to absorb small quantities of fat, and at this stage, fat may cautiously be added to the diet.

2 Liver extract—The studies of Rhoads and Castle indicated that liver extract is of paramount importance in supplying the underlying deficiency which is believed to be responsible for both gastro-intestinal and hæmatological manifestations. This should be administered in

adequate dosage as for the treatment of pernicious anaemia.

3 Vitamin therapy—In the presence of deficient intestinal fat absorption, it is logical to assume that the absorption of fat soluble vitamins A, D, and K, will also be deficient. These may therefore, be supplied parenterally. The B complex vitamins are probably supplied in satisfactory quantities in the liver extract.

An illustrative case report follows.

W. B., a 42 year old male was admitted to the medical wards of the Montreal General Hospital on November 1, 1945, with complaints of chronic diarrhoea of six years' duration, abdominal pain and distension, vomiting, flatulence and marked weight loss. He had undergone numerous hospitalizations, during two of which diagnostic laparotomies had been performed. The initial operation in March, 1939, had disclosed gross dilatation of the duodenum, and an enlarged mesenteric gland, removed for biopsy, had revealed marled fibrosis. A pathological diagnosis of mesenteric tuberculosis had been entertained but not definitely established.

Later in 1939, a second laparotomy was performed. It was alleged to have established that the previously noted dilatation of the duodenum was the result of pressure from an aberrant inferior mesenteric artery. This pressure had been relieved by a duodeno-jejunal anastomosis. Following laparotomy the symptoms persisted unchanged, and he had undergone further investigation with the following findings: (1) Stool culture showed the usual fecal organisms in the usual proportions, (2) pus, blood, and mucus were absent on repeated examination, (3) gastric analysis showed hypochlorhydria, (4) x-rays of the chest showed evidence of an old apical tuberculosis, (5) a barium series was inconclusive because of the disturbance of the normal bowel relationships as a result of the previous operations.

On admission to hospital, physical examination disclosed an intensely emaciated male who, in spite of marked weight loss, was comfortable, and did not appear severely ill. The skin showed moderate pallor, and the complexion was "muddy" but not icteric. The tongue was normal. The thyroid was not enlarged. The chest was clear. With the exception of a faint apical systolic murmur, the cardiovascular system was negative. The abdomen showed marked distension. There was a right paramedian incisional scar. The entire abdomen was remarkably "doughy" in consistency. No masses were felt and no free fluid was demonstrated. The liver and spleen were not palpable. The skin and subcutaneous tissue showed marked depletion, particularly about the buttocks. Rectal examination was negative but there was a small amount of bright yellow soft greasy stool on the examining finger. There were no other positive findings.

The history, physical examination and the previous hospital findings suggested that the symptoms were not due to an inflammatory lesion of the bowel, and the impression, coupled with the characteristics of the stool on rectal examination, suggested that the diarrhoea was of metabolic origin. A tentative diagnosis of (a) pancreatic insufficiency, or (b) sprue syndrome was made, and investigation was directed along appropriate lines.

Laboratory findings—The blood showed a mild macrocytosis with a cell diameter of 80 microns but no gross anaemia. Blood urea nitrogen was 18 mgm. per 100 c.c. Van den Bergh was 0.4 units. Fasting blood sugar was 0.111. Total plasma proteins were 5.6%, albumen 3.85%, globulin 1.35%, fibrinogen 0.03%. Blood Wassermann was negative. The stools were yellowish frothy and soft, had a fatty appearance and contained no blood, pus, mucus, parasites nor ova. Sigmoidoscopy showed mild atrophy of the mucous membranes. Gastric analysis showed absolute achlorhydria. The glucose

tolerance curve was not flattened. A barium series showed (1) Fragmentation and scattering of the barium (2) Loss of the normal featherly pattern of the small bowel mucosa (3) The appearance of sausage shaped loops of bowel.

The radiologist's report indicated a typical deficiency pattern consistent with the diagnosis of sprue syndrome. X-rays of the bones showed moderate osteoporosis. Chemical examination of the stools showed total fat, 70% of dried faeces, neutral (unsplit fat), 23% of total fat, fatty acids (split fat), 77% of total fat.

The chemical findings in the stool indicated that pancreatic function was adequate, and that the steatorrhea was the result of deficient absorption rather than impaired digestion.

These findings were considered to be diagnostic of the sprue syndrome and a treatment plan was outlined, as above, to include diet, liver therapy, vitamins and hydrolyzed protein parenterally.

The results of treatment were satisfactory, with improvement in the diarrhea and a gain of 17 lb within two weeks. There was little change in the hematological findings, which had not been conspicuous at the beginning of therapy. We considered that the dramatic clinical response constituted a satisfactory therapeutic test and corroborated the original diagnostic impression. Unfortunately the patient left hospital against advice before treatment had been completed, and evaluation of the long range results of treatment was impossible.

We believe that this case falls into the group which we would classify as "secondary" sprue. The basic etiology, we consider to be, either (a) disturbance of the anatomical relationships of the small bowel or (b) comparable to Hurst's case of sprue syndrome secondary to mesenteric tuberculosis.

Since the above case was studied, we have observed another patient in which imperative surgical interference, occasioned by gangrene of the small bowel, resulted in a comparable syndrome in which the hematological findings were outstanding and the alimentary symptoms secondary. Satisfactory response of both disturbances resulted from parenteral liver therapy alone. The latter case, we believe, also supports the view that secondary or "mechanical" sprue should be recognized as an entity.

CONCLUSIONS

1 The steatorrhea characteristic of the sprue syndrome is due to impaired fat absorption from the small intestine.

2 The etiological factors should be recognized as falling into two groups. (a) Deficiency of "extrinsic" and "intrinsic" factors as in pernicious anemia. (b) Mechanical factors preventing absorption from the small bowel, such as lymphatic obstruction and operative disturbances of anatomical relationships.

3 Deficiencies of ingestion and absorption

* We are indebted to Dr J W MacKay, Radiologist, Montreal General Hospital, for the radiological interpretations. Specimen radiographs are shown in Fig 1.

produce hematopoietic disturbances similar to those of pernicious anemia.

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INTRA-ABDOMINAL PRESSURES

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IN 1930 Livingston¹ wrote "In contrast to the frequency with which this term intra-abdominal pressure appears in surgical writings, little or no reference to the subject is found in textbooks of physiology. These source books offer little aid."

This statement still keeps all its freshness in 1946, for even the most recent treatises on physiology have not yet found a place in their index for the term "intra-abdominal pressure." The number of special articles on it published in the U S A in the last 30 or 35 years would not be over 12-15.

PHYSIOLOGICAL AND PATHOLOGICAL ASPECTS

Among the numerous phenomena which are likely to influence the intra-abdominal pressures (I A P) or to be influenced by them, pulmonary respiration deserves an important rank. Respiration, even of the most quiet type, would not permit complete rest in the abdominal cavity unless this thoroughly changed its form, its dimensions, and, consequently, its internal pressures at least 30 times in a minute. Although we read in Best and Taylor² that "the diaphragm is the chief muscle of respiration, its movements being responsible during deep breathing for 60% of the total amount of air breathed", we still cannot forget that the diaphragm constitutes one of the great muscular segments of the abdomen. This being so, I cannot but think that a significant proportion of the respiratory act until now attributed to this important muscle should really be ascribed to the physiological play of I A P. This should especially be so when, in considering coughing, we realize that this abdomino-thoracic partition has no great respiratory value except inasmuch as, supporting itself against the closed glottis and the thoracic contents, it participates in the

"mise en-tension" of the abdomen with the other muscles of the abdominal periphery

The lung specialist has certainly done well not to wait for a more thorough knowledge of I A P physiology before carrying out the injection of large quantities of air into the peritoneal cavity, as have Banyar,¹² ¹³ Rilance,¹⁴ LaRue-Henderson¹⁵ and many others. This procedure, however, should modify the status of abdominal pressures for a long while. When the same specialist, by direct surgical action upon the phrenic nerve, obtains a pulmonary collapse, he will probably admit with us that the desirable effects of the rise of the paralyzed hemidiaphragm can be explained, at least partially, by the effects of the repeated elevation of I A P. It is indeed my opinion that, even after phrenic nerve surgery, coughing straining at stool, or any other severe physical efforts are still able to produce very high peaks of pressure inside the abdomen, which directly react on the denervated hemidiaphragm. A third example of the lung specialist being able to modify profitably the I A P is when, with Alexander and Kountz,¹⁶ he treats serious cases of pulmonary emphysema by the wearing of a special belt "in order to maintain an adequate intra-abdominal pressure"

The gastro-enterologist is regularly consulted by those thin and elongated patients who suffer from various symptoms and, among many other therapeutic measures, he often prescribes to them the wearing for a long time of an individually designed corset, thus trying to bring about permanent relief of their symptoms by the use of a permanent artificial abdominal wall which would raise their I A P to a comfortable level. He may recognize too that some cases of gastric ulcer in man do not fit their psychoneurotic etiology (that *dermer crisi*) and, then, if he reads A C Vietor,¹⁷ he will find many good reasons to consider splanchnoptosis as "a potential anatomical path to gastric and duodenal ulcers". Where then is the explanation of splanchnoptosis if not in the physiopathology of the I A P?

The cardiologist does not forget that the variations, respiratory or others, of the I A P may constitute one of the most important factors in the blood circulation. As early as 1926, A E Fossier¹⁸ considers essential hypotension as a symptom of splanchnoptosis, it must be our aim to increase the abdominal pressure, "thus raising the diaphragm and thereby

giving a better support to the heart". In 1940 W S McCann¹⁹ attributes some cases of orthostatic hypertension to visceroptosis. Also in 1940, N C Gilbert *et al*²⁰ have tried with some success to demonstrate the action of gastric distension pressures on the circulation in the coronary arteries.

Though, generally speaking it might be said that hernia is probably one of the most easily diagnosed and most adequately treated human diseases, the pathogenesis of this so well-defined syndrome is still a subject of debate. In 1945, Minty and Minty²¹ say "The weight of medical opinion in regard to the cause of hernias is that they are a result of a congenital weakness in the individual", but in 1917 Fitzman-Marsh²² said "The theory of congenital malformations as the cause of hernia reached the height of its popularity about 20 years ago". We turn then to the opinion of M Cheiner²³ who, in 1940, wrote "In spite of all discussions, both written and oral, upon the subject of hernia, the problem seems to be of as much interest and importance today as it was fifty years ago". Once more we ask the question where is the explanation of hernia and its recurrence or re-recurrence if not in the physiopathology of the I A P? We could continue in this vein for a long time. For instance, in accord with recent articles published, we could put forward the importance of I A P studies to the gynecologist, the urologist, the obstetrician, and other specialists. Let it be sufficient to sum it up by pointing out prosaically, that you cannot sit down or get up, you cannot lift burdens, walk, cough or sneeze, expel any foreign body from one end or the other of your alimentary tract, laugh, sing, speak loudly or even breathe deeply before you have created, consciously or not, the necessary amount of pressure in your abdomen.

TERMINOLOGY

Some definition of the principal terms to be used is necessary.

1 *The abdominal cavity*—This is the space limited by the diaphragm above and the musculo-aponeurotic perineum below by the lumbosacral column posteriorly and the walls of the abdomen anterolaterally. We consider the pelvic cavity as a purely conventional division of the abdominal cavity. From the point of view of I A P studies, it does not exist

2 *The abdominal contents*—The abdominal cavity contains the whole of the digestive system, less the œsophagus, the whole of the genitourinary system, less part of the urethra and vagina, many important blood vessels and lymphatic organs, and, moreover, a serous membrane, the peritoneum, which has often misled and sometimes completely mystified experimenters on I A P

One has to take the peritoneum for what it is. Indeed, if the peritoneum, considered in all its anatomical details, virtually takes up a large space submitted to the laws of I A P as are the rest of the abdominal contents, it also forms, by the numerous folds of its perivisceral sheets, many ligaments and mesenteries whose functions are to support afferent and efferent circulation and innervation and, also, to oppose their action to that of gravity upon several abdominal organs

3 *The intra-abdominal pressures*—Under this term we wish to include all pressure phenomena that may possibly take place within the limits of the abdominal cavity

Personally, I do not like this prefix "intra" which is so persistently added to the term "abdominal pressure". Whilst there can be abdominal pressures due to extra abdominal causes, I think there is too much chance of this not very useful prefix making the term "intra-abdominal pressures" into a misnomer. Nevertheless, I shall continue to use the word "intra" throughout this article, but only for tradition's sake

4 *The modalities of intra-abdominal pressure*—In principle, all parts of the abdominal contents are capable of being influenced by I A P. In practice, however, one cannot conceive the possibility of measuring the I A P everywhere in the abdomen. For example, it would not be feasible to measure the pressure that exists at a certain moment in the middle of the hepatic parenchyma. Practically as well as theoretically one may say that I A P can be measured wherever an intra-abdominal fluid, natural or artificial, can transmit the pressures exerted upon it to an extra-abdominal manometer. As the abdomen is, after all, a great hollow muscle, it may therefore be said that all these pressures fall under two groups of modalities

"A" modalities—The I A P can be studied either inside the hollow viscera of the abdomen

—intestine, bladder, stomach, etc, or outside these same organs. There are therefore two modalities of the I A P, namely, the intra- or endovisceral pressures, and the intraperitoneal pressures

Here, again, the particle "intra" appears as a useless prefix to the term "visceral" and "peritoneal pressures". In fact, if one is thinking about intra-visceral pressures he will easily refer to all other abdominal pressures as being extra-visceral, i.e., intra-peritoneal. On the other hand, if one is thinking about intraperitoneal pressures one will easily refer to all other abdominal pressures as being extra-peritoneal i.e., intra-visceral

Until now the terms intra-peritoneal and intra-abdominal pressure have often been taken as synonymous in the medical literature. They have even been very freely exchanged in the same article. For example, it has been written "There is always a variable amount of pressure in the peritoneal cavity, known as intra-abdominal pressure",⁴ or "Briefly stated, intra-abdominal pressure, or more specially, intraperitoneal pressure, is the resultant of

"²⁴ or "That intra-abdominal pressure is normally negative is satisfactorily demonstrated by clinical observations and laboratory experiments",⁶ or even, "The intra abdominal pressure is not intra-peritoneal but rather endovisceral in its manifestations and, under normal circumstances, is made to equal the atmospheric pressure by the degree of tone of the abdominal musculature".²⁵ C R Lam²⁶ has made laudable efforts to bring to an end this confusion of ideas and concepts, but, unfortunately, he continues to classify the I A P under the three old headings, the intra-abdominal pressure, the intra-peritoneal, and the intra-visceral pressures, thus failing to note that the second and third of these terms cannot indicate more than modalities of the I A P. Intra-visceral pressure is to be regarded as the variable amount of pressure developed in a hollow abdominal viscus by the actual tonus of its own parietal muscular fibres or by distension of ingestive, secretory or excretory origin

From the point of view of general physiology, our division of the I A P into these two modalities would probably appear more didactic than practical. This we concede, but it is obvious that the study of some particular intra-

visceral pressure can afford much information. A number of recently published articles on the subject of cystometry has already proved the importance of measuring intra-vesical pressures. Intra-gastric minute variations of pressures have also recently been studied by Thornton *et al.*²⁰ as a means of emphasizing the value of the section of vagus nerve branches in the treatment of gastric ulcer.

"B" modalities—The IAP can be studied either during the conscious or unconscious rest phase of the abdomen's muscular walls, or during their total or segmentary active phase, whence we have two other important forms of the IAP, namely the static intra-abdominal pressure (SIA P), and the dynamic intra-abdominal pressure (DIA P).

The SIA P is to a large extent, a relation between the weight and volume of the abdominal

contents and the capacity of the abdominal cavity, which capacity also depends on the state of tonicity of the abdominal muscle. As will be proved later on, posture is the most direct factor in causing variations of these pressures.

The DIA P is the pressure excited on the abdominal contents by any voluntary or automatic contraction of one or a group of abdominal muscles. As will be seen later on, when the abdominal cavity has reduced its potential capacity by assuming its most spherical form, that is after a deep inspiration and closure of the glottis and when the entire abdominal muscle energetically contracts, very high pressures are created and transmitted to and through all parts of the abdominal contents. Only under these conditions do the abdominal contents behave like a true hydrostatic medium in a rigid container.

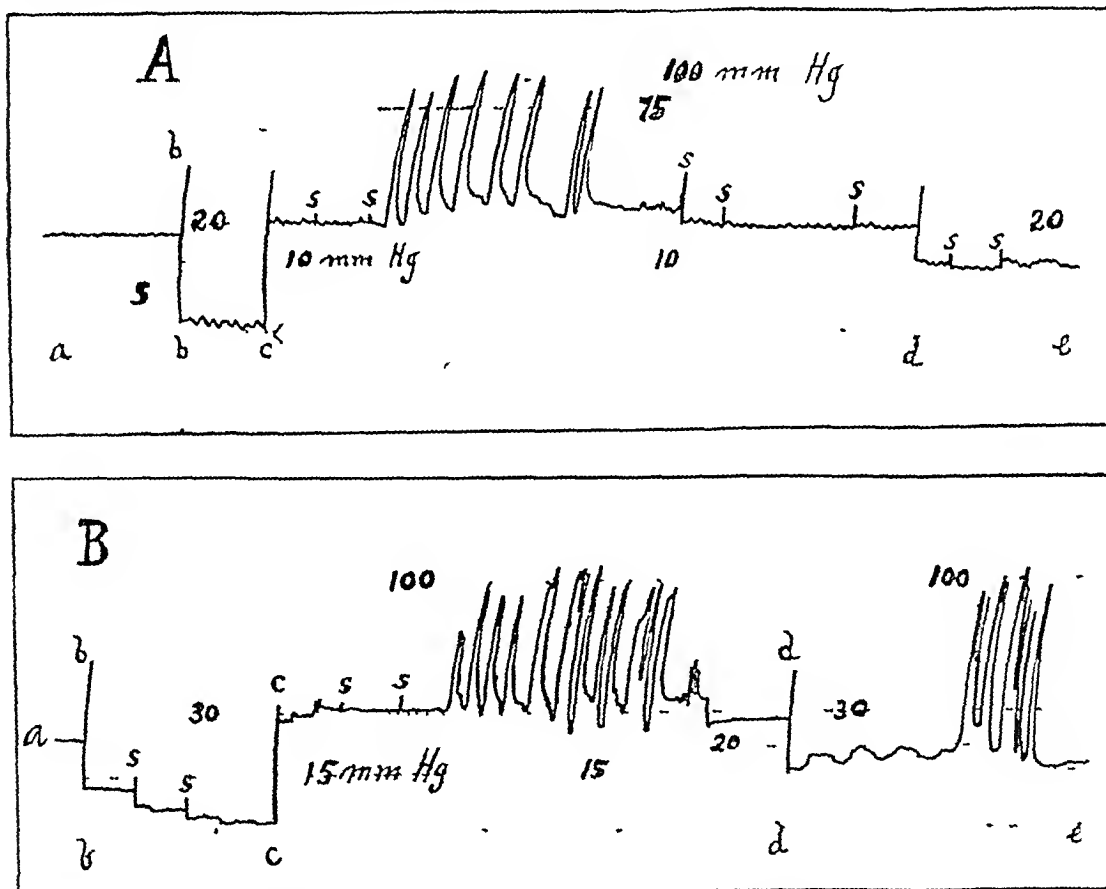


Fig. 1—A. Man, aged 21, abdominal circumference 33, height 63", weight 173 lb.
B. Woman, aged 29, abdominal circumference 36, height 63", weight 175 lb.

a-b Initial supine posture

b-c Kneel chest

c-d Erect

d-e Second supine posture in A and prone horizontal in B

Every point marked with a letter indicates either a change in posture, or a stop varying from 15 to 60 seconds in the unrolling of the kymograph paper.

Every marked rise has been produced by violent coughing.

THE PRACTICAL MEASUREMENT OF HUMAN
INTRA-ABDOMINAL PRESSURE

As I am aware that I A P and its variables have been one of the most neglected subjects in the field of general physiology and, as I believe that no further progress can be made in the physiopathology of these pressures so long as physicians are without an accurate and easy method of measuring them, I have evolved a method which seems to enable us to register any variation of the I A P This method has been

qualified by a friend as "discomagingly" simple, but I present it as it is, hoping that it will be improved on if found inadequate

Small rubber balloons of 10 c.c. capacity were made from hand sealed surgical drains and fixed at the end of convenient rubber tubings These balloons were then introduced into different parts of the abdominal cavity and inflated with 8 c.c. of air The tubes were subsequently connected to not too sensitive but sturdy enough metallic tambours whose excursions under pres

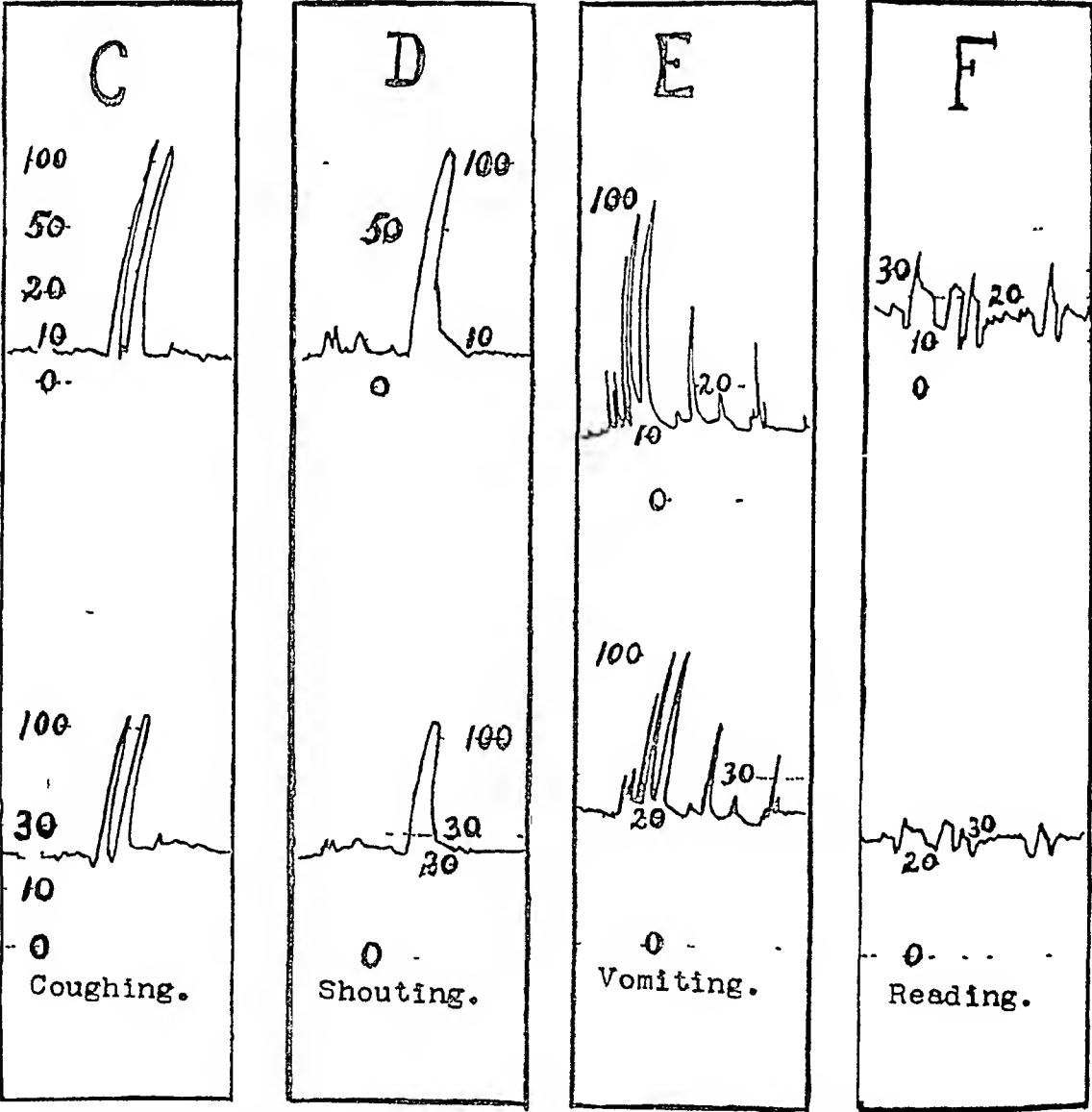


Fig 2—C, D, F Man aged 23, abdominal circumference 31", height 69" weight 149 lb
Upper graphs from gastric balloon
Lower graphs from rectal balloon
E Woman, aged 34, multiparous, in supine posture, weight 113 lb
Upper graph from intra peritoneal balloon introduced through a midline incision for epigastric hernia operation
Lower graph from rectal balloon

sure were transmitted through ordinary multiplying devices and registered upon an electric kymograph at any desired speed

Fig 1 shows 2 abdominographs taken from my own series. I shall not discuss the true significance of every fluctuation in these graphs, neither shall I compare them with each other, because I feel that no valuable scientific data can be gained from such comparisons unless one has at least many hundreds of identical records to compare. My purpose in presenting these graphs is to prove the ease with which a good number of S I A P and D I A P variations can

be registered in the same short session—about 15 minutes—by introducing a small rubber balloon just above the anal sphincters. The waves seen on graph A, between b and d are local respiratory I A P variations. As can be observed on Fig 3-G, these variations may eventually be of greater absolute value. Among the interesting features of graph B, are the three long waves of peristaltic rectal contraction which can be noticed between d and e, and, if my reasoning is correct, the height of these waves is the true measure of this intra-visceral pressure

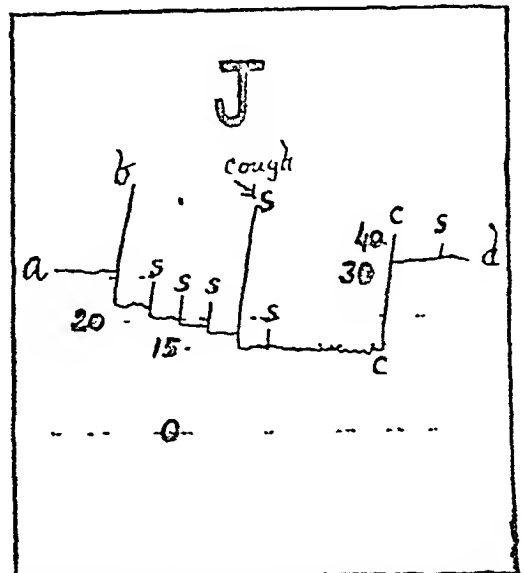
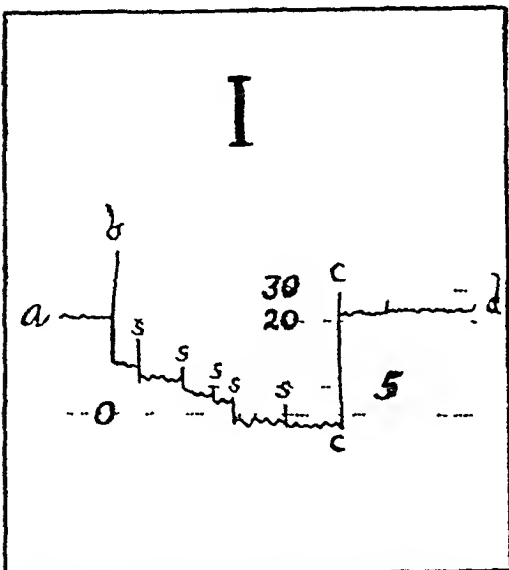
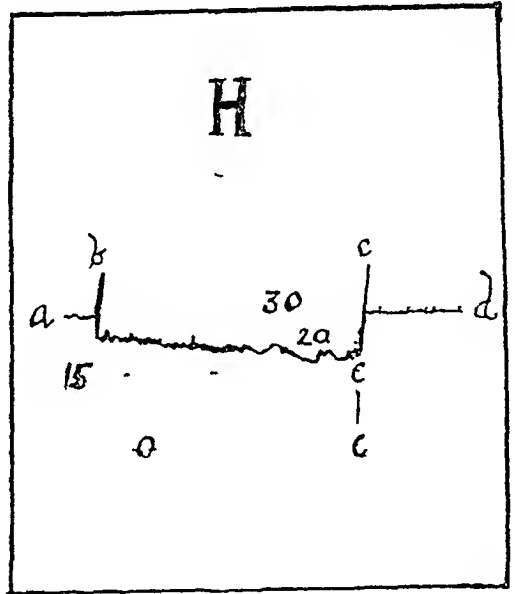
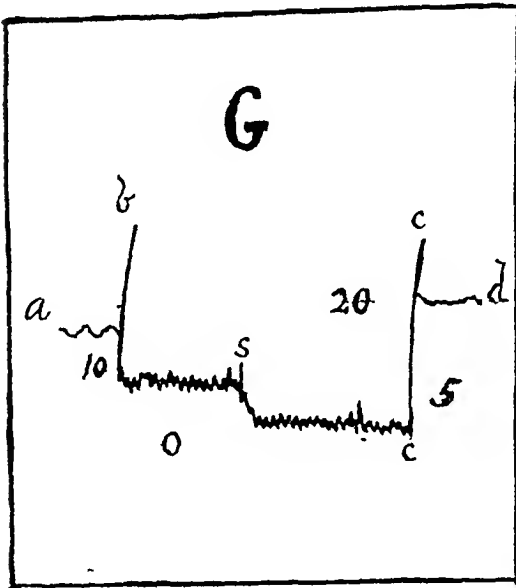


Fig 3—Knee chest posture individual static intra abdominal pressure variations [For key see Fig 1]

Fig 2 presents 4 metrograms of D I A P variations registered simultaneously at two distant points of the abdominal contents. Any one of the graphs C, D or E, is the picture of a particular strong abdominal muscle contraction. The ensemble of these 3 graphs makes it obvious that a strong muscular contraction of the total abdominal periphery will bring about the same peak of high pressure at any point of the abdominal contents where, prior to this contraction, the initial static pressure was 5, 10, 20, 30 or even 40 mm Hg. Hence, it is suggested that the most generalized and active I A P variations can be measured with as much accuracy at a single point of the abdominal contents as by simultaneous measurements at several distant points. This would give extra value to the interpretation of Fig 1 graphs which were registered from a single balloon introduced into the most accessible abdominal viscus. Graph F gives an example of moderate D I A P variations. It shows an overall correspondence of the pressure waves registered at two distant points in the abdomen while these points were submitted to the same cause of variation in local pressure, but, as the physical exercise involved in this experiment did not require a complete and violent participation of the entire abdominal muscle, it does not show identical summits of high pressure in both waves.

All 4 graphs of Fig 3 have also been recorded through rectal balloons. I think these graphs will give some idea of the S I A P pathological variations one may expect to encounter when the observed subjects are asked to assume the knee chest posture. G probably tells the simple story of a normal uterine reposition. H illustrates the poor mobilization of the pelvic viscera in a case of chronic parametritis and left chronic salpinx. Both I and J are chapters of the gastroenteroptotic romance, but J, objectively and subjectively, is much more pathetic.

Negative intra-peritoneal pressures under the diaphragmatic dome have often been reported by experimenters. "Because of the location of the abdomen", writes Livingston¹ "separated from the pleural cavities only by a thin musculo-fibrous membrane the upper portions of the peritoneal cavity display a slight reflected negativity, subatmospheric or tension phenomenon showing the presence of an upward pulling force". I am ready to endorse this generally approved concept of the subdiaphrag-

matic peritoneal negativity and will even agree to give up the knee chest "garrulitis vulvæ" to the physiology of the pleura if it can be proved that these two negative-pressured serous membranes can, by their sole existence, increase the abdominal capacity. Fig 4 - K

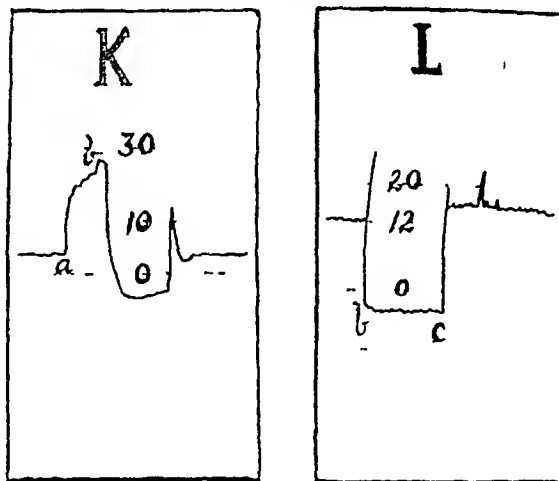


Fig 4

- K Gastric negative pressure induced by bulging out the thorax and abdomen after a deep expiration (a-b)
L Example of regular pelvic negative pressure induced by assuming the knee chest posture (b-c)

shows what happens within the stomach when, after a deep expiratory movement the erect man bulges out his thorax and abdomen while his glottis remains closed. As can be noted, this procedure develops an important negatization of the I A P in the stomach, as it probably induces a strongly negative intra-pleural pressure, but there seems to be no good reason to believe that the subdiaphragmatic peritoneal space would not participate in this gastric negativity, at least as much as it participates in the pleural negativity. As shown in Fig 4 L the I A P measured in the rectum is often found to be negative when the subject assumes the knee chest posture, and we think this phenomenon presents a close analogy with the subdiaphragmatic peritoneal negativity in the erect posture. Both of these negativities probably come from a normal disproportion between the abdominal capacity, which is often greater, and the volume of the abdominal contents, which is often less.

COMMENT

The suspended solution of so many clinical problems more or less intimately connected with the I A P appear to us as a stimulant to

a fair study of the normal and pathologic variations of these pressures. The few graphs hereby reproduced merely lift a corner of the veil which conceals the laws of I A P variations in man. The relative inadequacy of our own measuring equipment and, also, the lack of publication space, prevent us from giving just now to unveil more of these laws. For instance, static I A P variations have been studied on human subjects lying on a tilting device and records have been made while the tilting board was slowly moved from a 75 degree head up to a 75 degree head down position. Two or three graphs obtained through this procedure would give weight to the opinion that the static pressures in the upper abdomen might not increase in the same proportion as they decrease in the pelvis when the subject, prone or supine, is progressively brought from the horizontal to the head-down position. In other words, the static pressures encountered in and around such important abdominal viscera as the stomach, the duodenum, the transverse colon, the liver, the gall-bladder, the pancreas, the spleen and even the kidneys, are lower in the erect posture than the corresponding static pressures in the pelvis, but, though such extreme attitudes as the head-down position or the knee-chest posture would substantially diminish the static pressures in the lower portion of the abdominal cavity, they would not increase to the same degree the corresponding static pressures in the above mentioned viscera. If this theory happens to be confirmed by further experiments it would establish the fact that, whatever may be the habitual posture of the subject, the easy blood irrigation of the aforesaid organs and, consequently, their comparatively high secretory and peristaltic activities are not interfered with.

SUMMARY

- 1 The importance of I A P studies is stressed
- 2 A new concept of I A P definitions and classifications is formulated
- 3 A personal method for registering the I A P variations is described
- 4 Preliminary statements are made regarding the general laws of I A P

It is a pleasure to thank Dr Eugene Robillart chief of the laboratory of general physiology at the University of Montreal for his continued counsel and interest during the course of this work.

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FURTHER STUDIES ON ULTRAVIOLET RADIATION IN SURGERY

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IT has been stated recently that there are now 1,500 hospitals and 300 schools in the United States which are provided with ultraviolet germicidal equipment for air purification. The installations are in various parts of the hospital, including in some cases the operating rooms. The extensive and increasing adoption of such protective equipment seems to be due to the recognition by hospital authorities of four facts:

- 1 The development of aerobiologic studies and the consequent understanding of the importance of air-borne micro organisms in medicine, surgery and public health
- 2 The efficiency of ultraviolet germicidal radiation as demonstrated both experimentally and in widespread practical use
- 3 The safety of such radiation when tested by experimental methods and clinical experience provided the proper precautions are observed at all times
- 4 The acceptance of the Council on Physical Medicine of the American Medical Association of standard ultraviolet equipment for the uses

stated in such approval, and under the standards and limitations given therein.

These four facts have removed from the use of ultraviolet those earlier uncertainties, misgivings, and questionings which attend—and properly so—the coming of almost every advance in medicine or surgery. This is not to assert that the last word has been said or the last challenge met. Further studies are still needed and will be made. The manufacturers of ultraviolet generators will steadily improve the equipment, and operating rooms, auxiliary rooms, wards, and private rooms of the future will probably be planned in such a way as to make possible the optimum use of such means of air purification.

It is reported that early this fall the United States Navy Department, Bureau of Medicine and Surgery, will begin an extensive study of germicidal disinfection in surgery. The project will be carried out in the Surgical Department of the United States Naval Hospital at Philadelphia under the direction of Captain T. L. Willmon, Bureau of Medicine and Surgery, Naval Department, Washington, D. C.

The most recent literature issued by the largest manufacturers of ultraviolet equipment for air disinfection avoids exaggerations and unwarranted claims, and seems ethical from every standpoint.

It is not the purpose of this paper to speak either for or against the use of ultraviolet radiation in surgery. That is for the surgeon to decide, and the decision may vary with the needs and nature of the surgery involved, the construction and dimensions of the operating room, the reflectivity of its surfaces, and the rate of incidence of postoperative infections encountered locally.

The writer has heard more than one surgeon say "But what do we need ultraviolet for, anyway?" Postoperative infections have dwindled to the vanishing point under the best modern surgical technique, and our own rate here is so low as to be negligible."

Some other surgeons, equally competent and equally conscientious, have something quite different to report, however, and I will leave it to them to say it.

Moreover, the undesirability of wound contamination, even if outright infection does not develop, has been stressed by many surgeons,

and the prevention of air-borne contamination is a most important function of germicidal irradiation.

EXPERIMENTAL OPERATIONS

The primary purpose of this paper is to give a brief report on further experimental studies, —a smaller series to supplement the fifty operations described in a previous paper.¹ The same general procedures were followed, making repetition of technical details unnecessary. The only noteworthy changes were the use of nembutal anesthesia, and the use of two portable or "spot" generators for direct irradiation of the operative field. The animals used were rabbits.

The degree of irradiation was of high germicidal efficiency but well within the limitations laid down by the Council on Physical Medicine of the American Medical Association. As the fifteen minute period of irradiation was entirely uninterrupted, it would probably be a much greater exposure in total than in actual operations where the surgeons' hands, sponges, gauze, etc., interrupted the exposure continually.

Some of the operations were for the exposure of viscera other than those used before, and concerned the liver, spleen, kidney, and adrenal glands. Other operations dealt with structures encountered in orthopedic surgery. In a few animals the medial surface of the thigh was incised, and the femoral artery, great saphenous artery, femoral vein, and greater saphenous nerve were very carefully exposed with an absolute minimum of surgical disturbance, and all these structures then received direct irradiation. In other animals a longitudinal incision was made over the proximal half of the tibia, permitting the tibiais anterior and the extensor digitorum longus muscles to be drawn aside from the anterolateral surface of the tibia, and the extensor hallucis longus muscle to be drawn aside from the antero-medial surface. This allowed most of the proximal third of the tibia to be exposed without the slightest surgical injury, and the periosteum directly irradiated.

RESULTS OF OPERATIONS

At the end of two weeks, as in previous studies, the animals were sacrificed and examined, except in two cases which were examined immediately after operation.

No changes of any kind were seen in the abdominal viscera or—in the leg operations—in the muscles, arteries, veins, nerves or peritoneum. No gross or microscopic differences were observed in comparison with controls which had been subjected to the same operations but without irradiation. There was no functional impairment observable, and no difference in the rate and quality of healing.

PROTECTION OF PATIENT

It must be remembered that while wavelength 2537Å is germicidally very active it is not a deep penetrant, and even its germicidal power can be prevented by very thin layers of certain interfering substances. Surface cells, however, can certainly be injured by over exposure. For this reason it would seem desirable to minimize field irradiation in lengthy operations especially on visceral tissues. The production of histamine by ultraviolet stimulation might conceivably be of practical importance, and deserves further study.

The only references which the writer has been able to find as to field irradiation in neurosurgery are very limited and unsatisfactory, nor has he been able to find any neurosurgeon who approves of field irradiation.

PROTECTION OF OPERATING STAFF

The old method of exposing both the patient and the operating team to direct irradiation from an overhead octagon of ultraviolet tubes is now a thing of the past and has been replaced by indirect or striatum irradiation of the upper and lower levels of the operating room air, specifically at least seven feet above the floor for the upper fixtures and not above three feet from the floor for the lower fixtures.

Indirect ceiling suspension fixtures and wall bracket types which send all radiation upward or up and-down with baffle are now in use in operating rooms in Canada and the United States. It may also be desirable in some cases to have barrier fixtures installed above doors.

The large electric companies manufacturing ultraviolet equipment give clear and emphatic warnings as to protection of the eyes of the operating staff from ultraviolet reflection. Reflective ceilings and walls can send back enough radiation to cause irritation of the eyes. The degree of such risk can only be determined by the use of an ultraviolet reflect-

ivity meter in the hands of a thoroughly experienced lighting engineer, and it is urged that no installation be made without first calling in competent authorities to examine the operating room in question and make recommendations based upon that examination.

One company suggests that in some cases it might be desirable that all members of the operating staff who do not regularly wear corrective glasses be provided with plain glasses. This would give protection against ordinary amounts of reflection and goggles would be unnecessary.

Field irradiation can be accomplished either by small hand held radiators, or by a portable type such as that designed by Watson and referred to in a previous paper. Glasses should be used as there might possibly be some degree of reflection from instruments with broad surfaces, such as retractors.

Rules requiring the use of explosion proof switches and lamps also govern ultraviolet equipment.

SUMMARY

- 1 Use of ultraviolet germicidal equipment in hospitals and other institutions is widely increasing.
- 2 The results of further experimental operations to test the safety of field irradiation are reported in condensed form.
- 3 Safety measures for the protection of the patient and operating staff are described and stressed.

I am greatly indebted to Mr. Fred Guth of the Edwin P. Guth Company of Saint Louis for the use of a Guth direct irradiator and for helpful descriptive material, to Dr. L. T. Buttolph of the Ultraviolet Radiation Division of the General Electric Company at Nela Park, Cleveland, Ohio, for very valuable and complete information, and to Mr. F. A. Hodges of the same company, to Professor C. D. McDonald for help in installing ultraviolet equipment, to Dr. P. H. Huntington and Dr. George T. Trueman for making the same possible, to department staff assistants Alberta White and Barbara Shaw, and to many others for technical help.

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RESUME

L'installation de germicide des rayons ultraviolets est de plus en plus répandue dans les hôpitaux et divers autres institutions. Les résultats d'opérations effectuées sous ces germicides, sous le danger de protection du champ d'irradiation sont présentés, de même que les mesures de protection recommandées pour éviter l'abri de tout danger les membres du personnel de la salle d'opérations.

THE PROGNOSIS IN CANCER

By Norman A McCormick, M A, M B,
F A C R, F R C S (Edin)

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EXPERIENCE in treating more than 2,300 cancer patients during the ten year period from 1936 to 1945 inclusive, forms the basis of this paper. The patients have been treated on the Neoplastic Service, or in the Cancer Clinic operated by the staff of that service, in the Metropolitan General Hospital at Windsor. The former is an all inclusive service prepared to provide complete care to the cancer patient, and staffed by individuals particularly interested in cancer and representative of all the specialties. All hospitalized staff or indigent cancer patients are admitted directly to this service, rather than to the surgical or other regularly seen services. Patients on these other services found to have cancer are promptly transferred to the Neoplastic Service. The Clinic possesses the usual x-ray therapy equipment, a considerable quantity of radium element, and is in receipt of radon, or radium emanation from the Department of Health Laboratories in Toronto as required. The usual diagnostic and treatment instruments and appliances, peculiar to cancer work, are provided. Use is made of the contiguous roentgen diagnostic, cystoscopic, laboratory, and other standard hospital departments. By virtue of the various consultants, use may be made of any, or all of the facilities of either the clinic, or the indoor service for the treatment of private patients. Patients are accepted at the hospital only by reference from a medical practitioner.

At times one is confronted with skepticism that cancer can be cured, and it is quite true that on occasion, patients are seen with metastases ten, fifteen or even twenty years after apparently successful treatment of cancer, but these are rare and isolated instances. In our clinic, 38% of all patients seen with cancer were alive and seemingly well five or more years later.

Patients are classified as having been treated either for cure or palliation. The category is determined, not by what one might expect the result to be, but by the treatment procedure employed. All patients receiving a form of treatment constituting the very minimum which

might reasonably be expected to ever cure their particular type of cancer, are classified as having been treated for cure, even though one knew perfectly well that in many instances cure was practically an impossibility, *e g*, any patient having a resection of stomach or bowel, or a radical mastectomy, is classified as having been treated for cure. Irradiation alone, whether administered by x-ray, radium, or both together, is also divided into palliative and curative dosages, *e g*, a seemingly curable, but for some offside reason, inoperable carcinoma of the breast may be treated solely by x-radiation, with considerably larger dosage than would be administered for palliative purposes, and such patients are classified as having been treated for cure. Similarly, all patients receiving the full recommended course of x-ray therapy and radium for carcinoma of the cervix, no matter what the stage of disease, are considered as treated for cure. With these criteria, 58% of our patients were treated for cure, and of these there is a net 69.4% five-year survival.

While I do not wish to minimize the seriousness of even skin cancers, we have all come to look upon them as being particularly amenable to treatment, and in order to present a more informative picture of the results of treatment of cancer, they will henceforth be excluded from the analysis. Eliminating skin cancer patients, we find an absolute five-year survival of 26.2%, 49% of our cancer patients, still excluding skin cases, were treated for cure, many by compromise methods dictated by circumstances, and a net 58% of these survived five years.

Having demonstrated that a not unreasonable number of patients with cancer can be kept living and well for five years, the usually accepted period of time called cure, it behooves us to study ways and means by which this number can be increased. The problem naturally divides into two parts, first, what can be done to lessen the 42% failures amongst the patients treated for cure, and second, why were 51% of the patients treated only for palliation?

Unlike many disease processes which have a natural tendency for spontaneous cure, the condition of the untreated cancer patient steadily worsens, and in no other disease is the outcome so directly dependent upon the manner of treatment selected, and individual per-

* Read at the Sixty-sixth Annual Meeting of the Ontario Medical Association, Toronto, May 22, 1946

sonal care with meticulous attention to detail. While procedures may vary from year to year and from one clinic to another, certain broad principles have gradually developed in the treatment of each of the various forms of this disease. Every patient however must be considered as an individual problem and given careful study. An adequate plan of treatment must be worked out and instigated. Painstaking care and observation of the clinical condition of the patient must be exercised throughout and where necessary, modifications of the plan of treatment must be introduced. No relaxation of vigilance can be permitted, even on conclusion of the active treatment. It is also our responsibility to keep watch over the future progress of the patient, and this should be done at frequent and regular intervals for a period of many years. We ask patients to return in one month, and give them definite appointments for this purpose. They are seen again at intervals of from one to three months for the first year, and usually every three months during the second year, and seldom is the interval greater than six months thereafter. Patients are cautioned to report immediately should any untoward symptom develop, rather than to await the next appointment. Careful recall files are maintained, and it is our responsibility to contact the patient should the latter fail to keep his appointment.

The physician who undertakes the treatment of a cancer patient, assumes a very heavy responsibility. His patient's comfort and life are at stake. His conscience must be carefully searched to permit him to arrive at a conclusion as to whether or not he is in a position to offer his patient the best possible chance of survival, whether his results have been and can be expected to be the best possible, and whether he is willing to devote the necessary subsequent care and attention to the future outcome of his patient. Inadequate follow up examinations and the lack of a statistical analysis all too frequently prevent him from actually knowing what has happened to his cancer patients, and should he take time to investigate he is apt to find the results very much less hopeful than he had quite conscientiously believed to be the case. The physician who cannot, or will not fulfill these requirements, has no moral right to assume the treatment of such a lethal dis-

ease and should immediately refer the patient to someone who is in a position to do so.

While those of us who devote most of our time to cancer work see many patients who have had the best of care, others come to us after inadequate and at times inadvisably performed treatment which is not infrequently irremediable. Cancer of the breast offers a good example. Not infrequently a lump is removed or worse still cut into and a piece only removed and sent off somewhere for section and this happens even in hospitals equipped with adequate pathological service and prepared for quick section, and a diagnosis is not made for three, four or six days. Failure to proceed with proper treatment immediately in these cases is often disastrous. Again while patients frequently come to the clinic after having had a thorough and properly performed radical mastectomy, we do all too frequently see patients who have had very little, if any more than the simplest of local mastectomies masquerading under the title of a radical operation. In our own clinic 61% of the patients on whom I have done a radical mastectomy lived free from evidence of cancer for five or more years, whereas of those who came to us for x-ray therapy after having been operated upon elsewhere 35.7% survived for a similar period, and if we exclude the patients of a small group of the more painstaking surgeons, we find 23% living, results little short of terrible indeed. Careful study reveals no change in the stage of disease in these groups and the results can only be interpreted as indicative of the calibre of the operations performed.

As you are aware, surgery, x-ray and radium are the only agents which have as yet successfully cured cancer. Each has its definite field of usefulness and they should be regarded as complementary rather than antagonistic procedures. One can to advantage frequently combine two or even all three of these agents, and rarely does one see a cancer patient who would not at some stage of his disease be benefited by such a combination.

Cancer of the fundus uteri provides a good example of the efficacy of the combined treatment. Adequate surgery has in outstanding clinics resulted in an approximate 60% five year survival. Radium without operation salvages about the same number of the

operable cases, but when radium is followed by hysterectomy 75% survive¹ For best results, however, consideration must be given to the histological grading of the tumour The highly malignant, totally anaplastic grade 4 tumours are seldom, if ever, cured by surgery and should be treated solely by intrauterine radium and heavy external x-radiation At the other extreme of malignancy, grade 1 tumours should be readily curable by operation alone Best results in grade 2 and 3 tumours are obtained by the use of preoperative radium and panhysterectomy Unfortunately, many of these patients are obese, elderly individuals and poor operative risks, and these, if deemed inoperable, are treated by x-ray, alone if for palliation, or in conjunction with radium if feasible and free from obvious metastases

The routine practice in our clinic with carcinoma of the fundus is to fill the uterine cavity with radium at the time of diagnostic curettage This is left *in situ* a sufficient length of time, usually 40 hours to deliver 4,000 milligram hours, during this interval a careful microscopic study of the tumour is made and its grade of malignancy determined Panhysterectomy including removal of the entire fundus and cervix along with bilateral salpingo oophorectomy is done six weeks later on all operable patients with grades 1, 2 and 3 tumours and 87% of our patients survived free from evidence of growth for five or more years Inoperable cases and those with totally anaplastic stage 4 tumours are started immediately after the radium treatment with a full pelvic cycle of high voltage x-radiation, administered at long skin target distances to insure the maximum penetration and given through 6 pelvic portals to the limit of tolerance, usually 2,000 r measured in air to each portal, 27% of these inoperable cases remain well five years later Combined, the two groups show a 52% survival of all patients seen with carcinoma of the fundus We have no operable cases treated by x-radiation alone

Proper selection of treatment procedure, and integration when advisable of all those facilities at our disposal for the treatment of cancer will, in the hands of the careful physician, who is entirely familiar with the disease he is about to treat, bring about a gratifying increase in the number of living patients It is only fair to state, however, that we work under tremendous,

and what frequently seem to me, unreasonable handicaps We have for example treated in our clinic 235 patients for cancer of the cervix, 41% of 86 seen five or more years ago are alive and well, despite the fact that these women delayed seeking treatment for an average period of eight months after their first symptom, most commonly recognized as unusual bleeding Breaking these down by extent of disease, we find that the average stage 1 patient delayed 5½ months, and 82% of this group survived, while only 10% of the stage 4 patients lived after dallying for an average of 16 months (Table I) The average breast cancer patient discovered her lump 16 months before seeking treatment

TABLE I
CARCINOMA OF THE CERVIX
INFLUENCE OF DELAY IN SEEKING TREATMENT
UPON STAGE OF DISEASE AND PROGNOSIS

Stage of disease	Average number of months delay in seeking treatment	Net 5 year survivals		
		No of cases	Alive	%
I	5½	11	9	(82)
II	6	27	18	67
III	12	30	6	20
IV	16	10	1	(10)
All stages	8	78	34	44*

*Three patients died before treatment could be completed, 1 others were deemed unfit for complete treatment Excluding 3 patients who subsequently died of intercurrent disease, free from evidence of cancer, 31 of 71 patients given the full recommended course of x-ray and radium therapy lived 5 or more years—48%

Rates based on fewer than 15 cases are bracketed

While freely acknowledging that the stage in which we find a cancer is also dependent upon many other factors, such as the virulence of the growth, and the age of the patient, delay in seeking proper treatment is a very important consideration in the advancement and consequent lessened curability of the growth While there may be very little hope of sufficient immediate education of the masses to bring about a major degree of improvement in cancer curability by this means, the fact remains that for the individual sufficiently concerned and well informed to act promptly on symptoms which would to most of us appear alarming, the present day chances of survival are good in at least the group being treated for cure

We now come to a study of the 51% of patients, skin excluded, admitted in a condition fit only for palliation Unsuccesful treatment elsewhere with recurrence of the growth accounted for 25% of the patients treated palliatively and the results obtained in treating

recurrent cases have no influence upon the prognosis which one can offer a new patient presenting himself for treatment for the first time. In another 14% delay in seeking treatment for an easily recognizable and in its earlier stages entirely curable lesion was unquestionably the cause of the advanced stage of the disease. An additional 11% had easily recognizable tumours in sites accessible for cure and procrastination can be considered as the most probable cause for the patient's state when admitted. The remaining 50% had growths in sites admittedly difficult to recognize early or treat successfully, but at least some of these should have arrived in a condition worthy of an attempt at cure. We find then that 80% of cancer patients should be treated for cure with predictable success in 75 to 80% of these individuals. No more than 20% of cancer should be considered hopeless at this time, and in need of more effective treatment than is now available.

The patients were largely, but not entirely responsible for this loss of time before the institution of treatment. In studies of 218 of our patients^{2,3} we found that 44% were referred for treatment within 1 week of first medical consultation, 22% in from 1 to 4 weeks, 13% in from 1 to 3 months, 10% in 3 to 6 months, 5% in 6 to 9 months, 3% 9 to 12 months and 3% in from 1 to 2 years. Failure to heed medical advice as exemplified by the fact that we occasionally see patients 6 months and even 2 or 3 years after being so recommended by their physician accounts for a small part of this delay, but we must nevertheless face the fact the 31% of patients lost 1 or more months or valuable time after first seeking medical consultation.

We hear a good deal about cancer diagnostic clinics and are apt to visualize these as filled with elaborate and expensive equipment. The diagnosis of cancer can in most instances be made in any doctor's office. Three hundred new cancer patients were admitted to our clinic last year; the diagnosis of cancer was made in 254 of these by sight or touch alone, subject only to verification by biopsy and laboratory examination. X-ray, cystoscopic or other special examination was required in only 46 instances to make a diagnosis usually suspected from the history obtained. Daily experience shows that it is an error to suppose that this diagnosis is

usually difficult or expensive to make. The suspicion of cancer should exist and confirmation can usually be obtained by consideration and by someone completely familiar with the disease or by a biopsy. Mistakes are commonly made through carelessness and hurried and incomplete examination rather than through lack of facilities.

We have recently asked 100 consecutive cancer patients why they did not seek earlier treatment. It is a popular fallacy to attribute this reticence on the part of the patient to fear of the expense involved. In 4 instances only was expense named as a cause for the delay and even these patients coupled this with an admitted fear of the truth or its consequences. Carelessness and ignorance predominate as shown in such answers as "I thought it was nothing to worry about and would disappear", "it wasn't sore", and "too busy". Fear of the diagnosis or possible operation or other necessary treatment deter a large number of patients. 23 reported without delay. 17 had been under their doctor's care, usually but not always, for an obscure condition. It is perhaps a pity that the files of a cancer clinic are confidential. The record of our profession is gratifyingly high, no one is above an occasional error. The habitual defaulters are few in number but their score is so low, and their names appear with such monotonous regularity that they become well known to the staff.

Our experience in dealing with cancer of the rectum, and this of course is more or less typical of that of any clinic, is informative in that it illustrates the progress which has been made in the past decade, and warrants a good deal of optimism not only for this but many other varieties of cancer.

In the eight years prior to 1935, 11 patients were admitted to the Metropolitan General Hospital, Windsor, with cancer of the rectum. In only 1 case, or 9%, was the error detected and this in a manner which could not be considered adequate. This very small number of admissions makes the present picture of that time very sad indeed against operations as a useless procedure and even in the hospital. During the first six years of the clinic's operation an equal period of time 57 patients with cancer of the rectum were admitted and an additional 17 patients

been admitted during the past two and one-half years

The criteria of operability has undergone a decided change. In the early days of the service many advanced cases were seen, but from 1936 to 1939, 40% of the patients were radically operated upon, after this the resectability rate rose to 60% and in the last two years 84% of these patients had a resection and 87% were treated for cure. Unfortunately, there has been very little tendency on the part of the patient to seek earlier treatment, but there has been a more definite willingness on his part to submit to operation.

The risk involved in this operation today is not a factor of paramount importance. Any discussion of operative mortality without consideration of the surgeon's operability rate is incomplete, a high operability rate, indicative of the inclusion of advanced, poor risk, and elderly patients, justifiably carries a higher operative mortality than in a series of low operability rate. There has nevertheless in our group been a decline in the operative mortality from 40% originally to one of 3% in the past two years despite the rise in operability from 40 to 84%.

Even as a palliative procedure the operation is justified. There can be no question in the mind of any one familiar with this disease, that the relief from pain and tenesmus coincident with removal of the primary tumour is such that one should give the patient this benefit, even though he may have small liver or other metastases. The fact though, that 58% of the patients on whom resection has been performed are alive and well at the end of five years is the real encouragement.

Methods also have changed. Originally we preferred a two-stage operation, the resection is now almost invariably completed in a single session. We believe that the diminution in infection brought about by a short preliminary course of x-ray therapy obviates part of the advantage to be obtained by a two-stage operation, but even more important is its value in the case on the borderline of inoperability, in which we on occasions use a bit of radium in a doubtful area at the time of operation. There has recently also been a tendency towards preservation of the anal sphincter, and restoration of continuity, with abolition of the colostomy, but this should be mentioned only with

a word of caution. Such an operation is unquestionably less radical than the classical abdominoperineal resection,⁴ and its advocates having yet failed to demonstrate as satisfactory survival rates as by abdominoperineal resection, one should not lose sight of the fact that the real purpose in operating is to cure the patient.

There is still too much confusion in the minds of both patient and physician between the troubles of the individual who has a palliative colostomy, and the experiences of the patient whose growth has been removed. The former, still suffering all the discomforts of an unremoved cancer, naturally places responsibility for his difficulties upon his colostomy. The entirely different experiences of the patient from whom the growth has been removed show the error in this judgment. Careful enquiry of our entire group of patients who have permanent abdominal colostomies following abdominoperineal resections, revealed that these persons are carrying on useful and practically unrestricted lives. They have very little, if any difficulty with their colostomies, wear no appliances other than a small square of gauze to protect their clothing from mucus or accidental discharge, eat practically normal diets, and without exception are prepared to recommend this operation to anyone having a cancer in the rectum. It should be pointed out also that the obvious advantages to the patient of restoration of continuity and abolition of the colostomy are apt to become serious disadvantages should he be unlucky enough to have a recurrence of his growth. All told, I believe there is a very real place for this modification of the operation, but that it should be looked upon as a reward to the patient who heeds his symptoms and seeks aid at an earlier stage of his disease than do many of our patients at this time.

To recapitulate, with practically no more risk than any other abdominal operation, we now operate upon and resect 84% of the cancers of the rectum instead of the 9% done ten years ago. An additional 3% are treated by radical irradiation. With little or no ultimate discomfort to the patient, we offer him a 58% chance of cure, which would rise to at least 80%, if he would use only reasonable intelligence in response to his alarming symptoms.

The same story of progress, with only minor variations, could be repeated for a large majority of the commoner varieties of cancer

SUMMARY

1 Thirty-eight per cent of all patients seen with cancer have survived, seemingly well for five or more years

2 Methods for improving results are discussed The responsibility in accepting a patient for treatment of cancer is heavy Competent management of the case, selection of the proper method of treatment, and an endeavour to educate the public to seek treatment earlier are well worth while

3 Delay on the part of the patient is not brought about by financial consideration but through ignorance, procrastination or fear of the truth or its consequences

4 The medical profession while most frequently alert to the situation, has shown itself responsible for a significant part of this delay

5 Eighty per cent of cancer patients should be treated for cure and 75 to 80% of these could be cured

6 The change in attitude towards cancer of the rectum over a ten-year period as outlined, can be applied to many other varieties of cancer

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RESUME

Les statistiques démontrent que 38% de tous les malades observés pour cancer ont survécu, apparemment en bonne santé relative pendant 5 ans et davantage. Les moyens d'améliorer cette statistique sont discutés. Ce n'est pas une mince responsabilité que d'accepter de traiter un cancéreux. On recommande, de toute évidence, de confier ces cas à des mains compétentes de choisir le mode de traitement le plus efficace et d'éduquer le public sur l'importance d'une prise en charge précoce. Les malades qui tardent à se faire traiter le font moins par embarras pécuniaires que par ignorance, négligence ou crainte de connaître la vérité. La profession médicale, pourtant constamment sur le qui-vive à propos du cancer est cependant responsable d'une part importante de ces retards. On estime que 80% des cancéreux devraient être traités et que de 75 à 80% de ceux-ci devraient guérir. Le changement d'attitude à l'égard du cancer du rectum au cours des 10 dernières années est souligné. Ce changement d'attitude peut s'appliquer de plusieurs variétés de cancer.

JEAN SAUCIER

THE ROLE OF THE EMOTIONS IN THE PRODUCTION OF GASTRO-INTESTINAL DISTURBANCES

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THE human gastro intestinal tract is richly endowed with 'autonomic nervous control, perhaps more generously than any other portion of the anatomy. It is not surprising therefore, that it is the most fertile field for symptoms which have emotional causes and correlations. This fact in varying degrees has been recognized in and outside of the healing profession since the dawn of human time. No other function of the body plays a greater part in the emotional life of a person from infancy on than does the taking of food. Satisfaction of hunger cravings is deeply ingrained and forms an essential part of our early conditioning and is intimately associated with feelings of somatic well being and of being loved and wanted. To the healthy and happy infant, feeding and loving are inseparable. By the time adult life is reached and emancipation from childhood dependency relieved, there has been a modification or sublimation of this relationship which latter is not compatible with easy self reliance and independence.

Alexander¹ deals with his gastro intestinal cases of emotional origin under three groupings: first, a wide range of patients, from those with minor gastric symptoms such as epigastric distress, nausea, belching, heartburn, etc., to those with actual peptic ulcer. The second group have the predominant symptom of diarrhoea and are commonly diagnosed mucous or spastic colitis, with painful cramps and anxious evacuations, alternating with constipation. The third group have chronic constipation as the predominant symptom.

This grouping has much to recommend it but I must confess a limited experience in dealing with the last two groups, at least from the psychosomatic approach. Whether or not we agree with or even understand Alexander's psychoanalytic concepts, it must be admitted he has made a worthwhile contribution to the deeper understanding of these baffling mys-

¹ Read at the Seventy seventh Annual Meeting of the Canadian Medical Association Section of Psychiatric Branch, Alberta, June 14, 1946

teries, which in our ignorance we lightly dismiss under such meaningless terms as "neurogenic" Alexander suggests that we try to understand the emotional attitude of the individual to his environment in terms of three tendencies (1) to receive or take, (2) to retain, and (3) to give, and he believes that if the normal channels of emotional expression are blocked by inner conflicts, the gastro-intestinal tract may become the regular channel of their expression

The first group, the gastro duodenal one, is said to have deep seated urges in the direction of a dependent-receptive rôle, which the patient attempts to deny or reject, (I might add resent), and the denial takes the form, usually of over-compensation, over-striving, and going all out in the direction of independence and self-sufficiency Others of the same discipline as Alexander have since, or have more recently, identified the dependency urge as a maternal attachment, which is being denied by the pa-

effects in relation to all psychosomatic conditions involving the gastro-intestinal tract, by giving particular attention to the group which includes conditions commonly referred to as "gastric neurosis" or "functional dyspepsia", and peptic ulcer It will be noticed that I put them in the same group I go a step further and claim that there is a fairly close kinship between peptic ulcer and psychoneurosis-anxiety type Being convinced of this kinship as a result of the study of the emotional lives and backgrounds of numerous cases of peptic ulcer over a period of many years, I wondered whether there might be proof of this in Service statistics An opportunity came last winter through the kindly co operation of the Statistical Division of the Department of National Defence (Army), which on request, provided me with the raw figures for admissions to hospital by months from the beginning of the war of two morbidity groups, peptic ulcer and psychoneurosis anxiety type The accompany-



Chart 1—The broken line represents psychoneurosis, anxiety type, the solid line gastric and duodenal ulcer

tient or frustrated by circumstances, the latter forming the precipitating cause for the onset or recurrence of symptoms The maternal dependency theory may provide some explanation why gastro-duodenal disturbances are mostly exhibited in males

In the second group there is the same deep-seated dependency conflict which is also denied, but it finds expression through painful evacuations which represent symbolically a two-fold effort, to make restitution, and to express aggressive and even sadistic tendencies

In the third group with constipation of psychic origin, the symptom represents a rejection of an obligation to give, and is frequently associated in the same individual with tendencies towards thrift and even stinginess

These are not necessarily my views, but I am inclined to give them prominence because I am in agreement with Alexander to a large extent in relation to the first group, which is the only one to which I have given special study Much can be learned about emotional

ing chart includes only admissions to hospitals in Canada, but of course from a certain date there is an admixture of cases from overseas after return to Canada The overseas story has been omitted because of some obvious distortions which largely represent policy distinctions in the use of certain diagnostic terms These distortions are unfortunate because otherwise there seems good reason to believe that once the fighting began and frustration of that type ended, the incidence of peptic ulcer dropped, whereas anxiety neurosis in relation to external causes for fear, increased

It will be seen that there is an amazing parallelism in the hospitalization incidence of peptic ulcer and anxiety neurosis Perhaps I can throw some light on the parallelism by outlining briefly some observations made by myself and departmental colleagues in relation to these two groups

1 We frequently see frank anxiety neurosis and peptic ulcer in the same patient, either concurrently, sequentially, or reversely

2 A family pattern of anxiety and tension may express itself in different members of the family as anxiety neurosis or peptic ulcer, or some other variant with which we are not at the moment concerned. The determinants are not very clear, why one has ulcers or gastric symptoms of the neurosis type, and another frank anxiety neurosis. At any rate it is my belief that no case of anxiety neurosis has been completely studied unless there has been careful enquiry into the possibility of a family pattern of anxiety, which should include enquiries regarding "stomach symptoms" and ulcer, vice versa similar enquiries should be made regarding anxiety states in parents and siblings in cases of peptic ulcer.

3 Our studies of the emotional background of ulcer cases suggest a close relationship between the psychic mechanisms of these and of ordinary cases of anxiety neurosis. I have yet to see a frank ulcer case even one in which there is a good life adjustment (according to ordinary standards and appearances) without being able to uncover with this case an insecure looking childhood background plus some disturbing concern in relation to the immediate life situation. So far as my experience goes the emotional life histories of my ulcer and of my anxiety neurosis cases are interchangeable but of course I have not delved as deeply into the basic mechanisms as has Alexander and others. However I believe that we can stop short of using deep psychoanalytic techniques and yet do an effective and constructive job in both peptic ulcer and anxiety neurosis.

I believe further that no case of peptic ulcer is being adequately treated, except perhaps in relation to the immediate digestive upset, without a study of the unhealthy emotional background. Whether that study requires the help of a psychiatrist depends largely on the insight of our colleagues in other branches of the profession and the care that they devote to the emotional portion of the life history.

4 Recent studies indicate that there are some electroencephalographic and personality correlations between peptic ulcer and anxiety neurosis. Ruhn and Bowman² find a dominant alpha rhythm $3\frac{1}{2}$ times as frequently in the ulcer as in a control group. Previous studies by Saul and Davis correlated dominant alpha records with personality types such as found in ulcer and anxiety cases.

In a group of peptic ulcer cases on the service of Dr Lawrence Brown, Veterans' Pavilion, Ottawa, our psychological studies with the Rorschach test have suggested a rather uniform response, which superficially resembles a schizophrenic one, but unfortunately we have had to discount the results as some of the cases at the time of testing were on insulin treatment.

The remarkable studies of Wolf and Wolff³ and by Wolff and associates⁴ have established beyond doubt that certain specific emotions such as anxiety, resentment, and anger were almost always accompanied by an increased secretion of hydrochloric acid and pepsin, and by some other autonomic phenomena. These reactions were observed in subjects with or without ulcer but in the ulcer patients pain often developed as well and the autonomic changes on the whole were greater. When feelings of assurance were induced gastric function returned to normal. In one special subject with a gastric stoma, anger or resentment produced a turgescence of the gastric mucosa and an apparent vulnerability to minor injury, which otherwise had little effect.

We have observed many cases in which it has been possible to show a close up sequence between emotional stress and gastric symptoms. Dr Robert Lairdlaw has an interesting case that illustrates this immediate sequence as well as some other points.

He, aged 29, was repatriated from overseas in 1945 on account of duodenal ulcer confirmed by x-ray on admission to the Veterans' Pavilion Ottawa. This man volunteered to Dr Lairdlaw after psychological testing that he had a return of some of his symptoms during the performance of the Minnesota Multiphasic Personality Inventory. "Well, there were some questions I didn't know how to answer. Yes, I guess you are right when you say a fellow can't make a decision. Anyway I couldn't make a decision about some of those cards and I found my hands got wet and the pun in my stomach come back on me."

This case not only shows a close time sequence between a specific frustration and a recurrence of gastric and autonomic symptoms but it serves to illustrate that in ulcer cases there is a striking lability of the autonomic reflex in response to minor psychic stress. Psychiatrists are more attentive to such influences than to the usual problems of hyperacidity and of dietary and other restrictions which preoccupy our colleagues in other branches of the profession. In fact we believe that imposed cautions and restrictions tend to

create their own somatic tensions in these labile cases

This patient exhibited other significant features, he had Grade 7 only, was very conscious of his educational defects and was constantly striving to improve his manners and speech. He has always regretted since having to leave school at twelve to help his parents. The regret amounts to resentment, and although he is a very dutiful son and unusually devoted to his parents he has always resented the fact that as the single son the responsibility for his parents, who are frequently ill and dependent, devolved on him and was shirked by the five brothers who also dodged military service, most of them by medical rejection. Although he has had habits of worrying most of his life, it was worry over his parents' health while he was overseas that precipitated the onset of dyspepsia, and that a conflict situation in relation to his girl friend back in Canada.

He has had ideas of marriage but that had to be postponed until his parents were better situated. In any case, and this is the burning frustration, the girl's mother will not listen to marriage, she thinks he is uncouth and not good enough for her daughter. In a long interview he revealed fairly intimate details of his emotional history and that of his parents and siblings, but said nothing whatever about the matter that was giving him deepest concern, until he was on the point of leaving. In the meantime he readily revealed many neurotic traits in childhood, fear of the dark to age 20, enuresis, nightmares, and truen sickness, told of his father having suffered from "stomach ulcers" until operation in 1938. Two brothers were rejected for Service on account of "stomach ulcers". One other brother has "digestive complaints", and another has a vile temper and they dare not cross him. Only one brother and sister are regarded as well. Another sister has "stomach trouble, worries a lot and is very nervous". The mother has always been a worrier and was afraid to let the boys out of her sight.

The most frequent combination of emotional factors in our cases seems to be "mother a worrier" and the patient himself with a background of insecurity or resentment and some immediate cause for concern or frustration. In my experience resentment is the highest common factor. This seems difficult to believe or accept in the face of a calm exterior and a good-looking life adjustment. Resentment is cheap in these days when everybody has his own pet hate, but I refer particularly to deep seated resentments, those which represent displacement of anxiety or replacement for frustration. It is a safe rule that hostility is present in everyone who has inner anxiety or feels threatened.

Resentment-producing conflicts are enhanced in peptic ulcer by reason of the fact that the emotions are held in check and rarely permitted free expression. These patients need to warm up rather than burn up. People who readily externalize their emotional tensions are unlikely to harbour deep resentment or to develop an ulcer. Because of the emotions being blocked from outward expression it is

likely that day to day irritations, increased by reason of sensitization in childhood, find expression only in inner tensions with resulting interference with the proper functioning of the gastro-intestinal tract. Beneath a placid unemotional exterior there is often a seething struggle and the battle ground is the ulcer bearing area.

An individual may not be fully aware of his tensions or his worries. It is not necessary that the emotions or concerns be perceived in consciousness, to cause a disturbance in the function of the internal organs. This is shown in cases of ulcer with increased night secretion often in association with disturbed dreams and restlessness.

Psychiatrically speaking, there is apparently no great difference between peptic ulcer and gastric neurosis except that the latter has a more heavily laden background of childhood conflict and neurotic traits, and in addition, increased somatic concern and awareness. The life adjustment is more faulty than in the ulcer case, and the attempts to overcome the dependency urge are more feeble. It is not surprising therefore that hospitalization or too great protection from economic stress must often prove fatal to rehabilitation in functional dyspepsia.

The subject of this paper would seem to exclude any reference to treatment but in any case in which there are important emotional components, treatment is indissolubly intermixed with the clinical interview. It should begin with the initial greeting and continue throughout the unfolding of the emotional history. An unhurried interview with few of the trappings of professional approach, is essential. It is of no use asking the ulcer patient whether he has worries, actually that is considered a poor approach to any case. One should expect and deserves to get a negative reply to that style of questioning.

In addition to the therapeutic style of history taking, it is essential that the physician reflect confidence and avoid sensitizing the autonomic reflex further by imposing too many cautions and restrictions and insisting on too many procedures and rechecks. Dr Laidlaw and I have handled several cases with apparent success to date by first clearing up the conflict material and frustrations, after which caution is thrown to the winds by putting the patient

on full diet without medication and allowing him to be up and around. It might seem preferable and logical to omit certain items and roughage from the diet. It might seem advantageous that tobacco, coffee and condiments be omitted or forbidden, and that the patient spend the first week or two in bed, but as in dealing with our frank psychiatric patients, we have come to the conclusion that where we gain in one respect by cautions and restrictions, we lose in another. I do not think that the average ulcer case takes kindly to restrictions, even if he is consciously tolerant of them, he is not so unconsciously, and this is reflected through the libidinal autonomy control. Medication can be a crutch and as such I believe the patient takes too kindly to it, depending upon it for immediate relief and for control of symptoms which he can be taught to deal with in other ways.

If facilities permit group psychotherapy should be used, but never as a complete substitute for individual exploration and therapy. Group talks should consist of simple diagrammatic demonstrations of the anatomy and physiology of the gastrointestinal tract, including the influence of emotions. It is well to assume that all peptic ulcer cases have a tendency to worry too much and to discuss and re-discuss their symptoms in the hospital and at home. Group talks should discourage any discussion of complaints outside of the class or the examining room and should provide instruction how to interrupt habits of worrying, the best method being to interpose pleasant thoughts, choosing for this purpose the happiest moment in the patient's life.

Peptic ulcer should be explained as a reversible condition, recovery from which depends a great deal on the patient's attitude. Besides controlling worry and avoiding discussion of symptoms, he can contribute much by learning how to laugh and relax and to succeed without striving. It is believed that prevention of further upsets can be achieved by the use of these methods.

To those who are curious but unbelieving regarding the essential emotional components of peptic ulcer, I would suggest a little experiment. Select one of your ulcer patients whom you do not know socially, invite him to your house and your den for a quiet informal evening chat. Tell him you have been listening to

a fellow who has some funny ideas about the emotional background of ulcer. Tell him, if you like, that you are not quite convinced and then let him do the rest, provided that you give him the whole evening in which to extend himself. Don't do too much of the talking and have little to say by way of advice or admonition. You may, if necessary, put in prompting questions here and there regarding parents, brothers, and sisters, and how they are getting along, enquire about the wife and children and business, but avoid discussion of symptoms, certainly any elaboration of them. Rather let the conversation deal with worries, anxieties, frustrations and disappointments. If you sense resentment or hostility along the way keep it in mind and bring the touchy subject up by itself later in the evening.

May I add a suggestion regarding the handling of deep resentment and hostility in any patient, because after all, these emotions are not confined to ulcer cases but are almost specific in certain other conditions in which they are perhaps no better understood than in ulcer, for instance in hypertension. Let us suppose that resentment is expressed against a parent, give it free rein for a while and perhaps give encouragement of other hostility ventilation. But free ventilation alone is not sufficient in dealing with hostility against someone who ordinarily should be loved and respected. Therefore, I usually wait till near the end of the interview and then ask sympathetically, "Tell me something about your father, what his background was and what he had to put up with as a boy." That sort of question enables you to close on a constructive and happy note.

One or two such of the record interviews will enable the patient to get a lot of his chest and relieve many of his inner tensions, but of more importance, will give you some insight into the psychic mechanisms of patients and then attitude towards all disease including psychosomatic conditions. You will now understand better why your patient in the atmosphere of the busy office replied in the negative to your question whether he had any worries.

SUMMARY

Emotional influences chiefly those reflecting deep seated conflicts have definite effects on the gastrointestinal tract, even to the extent

of producing pathological changes as in peptic ulcer and special forms of diarrhoea and constipation

There is a close kinship between anxiety neurosis and peptic ulcer, and between peptic ulcer and so called "gastric neurosis". Psychotherapeutic methods of dealing with anxiety neurosis are equally effective in peptic ulcer

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RESUME

Les émotions, notamment celles qui proviennent de conflits affectifs très refoulés, ont des effets très nets sur le tractus gastro intestinal. Il est admis que celles-ci jouent un rôle important dans le genèse de certaines diarrhées et constipations et qu'elles vont jusqu'à provoquer l'écllosion d'états somatiques aussi sérieux que l'ulcère peptique. Il existe d'étroites relations entre la neurose d'angoisse et l'ulcère peptique d'une part, et entre l'ulcère peptique et la "neurose gastrique", d'autre part. La psychothérapie, dont le choix et la méthode varieront selon les préférences et tendances individuelles aura des résultats également efficaces, et dans la neurose d'angoisse, et dans l'ulcère peptique. Ces séances ne devront pas être précipitées et le thérapeute devra attacher une grande importance aux antécédents, personnels et héréditaires, du sujet, de même qu'à l'histoire détaillée de ses craintes, haines et frustrations.

JEAN SAUCIER

THE EFFECT OF BENZEDRINE ON MENTAL OR PHYSICAL FATIGUE IN SOLDIERS

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THE experiments described in this paper were carried out in the early part of 1942 when pressing calls on man-power necessitated the investigation of all possible methods of conserving energy in soldiers. Reports from enemy sources at that time revealed that analeptics were being used by German tank crews and other troops in North Africa. The Medical Research Council established a sub-committee on analeptic substances, under whose auspices a memorandum was issued in which all the available data on the use of benzedrine and methedrine in war was subjected to critical evaluation. The effect on muscular exercise was summarized as follows:

"Benzedrine (phenylisopropylamine) in certain doses and under certain conditions produces an increase in muscular output measurable in laboratory experiments. The action is due to temporary suspension of deterioration of output as fatigue sets in. The effect is probably obtained by making the subject less aware of muscular discomfort and general feelings of tiredness and not by any simple or direct action upon his muscular or physical powers. The effect commences about one hour after administration of the drug and lasts for one to three hours or somewhat longer. Benzedrine does not increase the efficiency of a fit and untired man nor is it apparently effective if complete exhaustion has already set in at the time of its administration."

More recently, investigations have been carried out in Scandinavia and Russia on the effect of benzedrine or peivitin (d-desoxyephedrine) on physical and mental efficiency in severely fatigued individuals,¹ in aviators,² and as an agent increasing working capacity during prolonged night vigils of military campaigns.³

Numerous reports in the literature support the view that benzedrine exerts a stimulative effect on the central nervous system, influencing mood, preventing mental fatigue, increasing the powers of concentration and inducing wakefulness.^{4,5} These factors, and especially the capacity of the drug to retard sleep, have been regarded as of possible use to soldiers in the field.

The experiments described in this paper were carried out to determine the effect of benzedrine on soldiers taking part in physically or mentally fatiguing exercises with special reference to the ability of the drug to allay fatigue and to prevent deterioration in military efficiency. For purposes of assessment, military efficiency was defined as "the capacity of a subject to complete a problem or exercise in a satisfactory manner."

In all these experiments, the substance used was benzedrine (amphetamine) sulphate.

THE EFFECT OF BENZEDRINE ON PHYSICAL FATIGUE IN SOLDIERS

Two separate experiments were carried out. In Experiment A, the performance times and the rifle-firing ability of two groups of 50 soldiers each were compared in the fresh state and after a fatiguing exercise. One hour before the end of this exercise the subjects of one of the groups took 15 mgm of benzedrine each, the other group took an inert substance indistinguishable in appearance from benzedrine.

In Experiment B, three groups each of 50 soldiers participated in obstacle course and rifle-firing assessments in the fresh and fatigued

states Two of the groups took benzedrine in divided doses totalling either 30 or 35 mgm. The third group took an inert substance identical in appearance with benzedrine. The performance times and rifle scores were analyzed statistically. Immediately after the experiment, each participating subject answered a questionnaire designed to find out his subjective reactions to the substance he took.

Test subjects—The subjects in each experiment were non-commissioned officers and men drawn from an infantry battalion. The groups of 50 men were chosen so that the average age, height and weight of each group were as similar as possible. One or two officers specially chosen for their quality of leadership, were attached to each group.

Prior to the experiments the subjects underwent a period of training lasting in the first experiment for one week and in the second for three weeks. Training consisted of day and night marching, running, physical training, field craft, digging exercises, platoon and unit drill, obstacle course exercises, map reading and fundamental training which included numerous talks on the care of the feet. Several times each week all the subjects taking part in the first experiment went over an obstacle course similar to that used in the experiment. In the second experiment, rehearsals on the test obstacle course were carried out several times each day.

During the experiments, the subjects wore battle dress, webbing, steel helmets and carried rifles and bayonets.

Obstacle course—In each experiment, the obstacle course consisted of a number of obstacles which were conventional in type, none of them calling for any special gymnastic or athletic ability. In the first experiment the course was 227 yards long and comprised 6 obstacles. The obstacle course in the second experiment was 500 yards long and comprised 9 obstacles.

The procedure of carrying out the obstacle course assessment differed slightly in each experiment. In Experiment A, the subjects were not allowed to undertake any practice runs over the course although from their previous training they were familiar with the types of obstacles which were included in the course. They were encouraged to put forth their maximum effort by various methods of motivation.

After a preliminary walk around the course the subjects undertook the course and the times

to complete the course from start to finish were noted. On completion of the fatiguing exercises the subjects were timed over the course again.

Within the week prior to the commencement of Experiment B, the subjects participated in several trial runs over the course so that when the first timed run took place in the fresh state, the men were already well familiar with the course and the obstacles. Motivation was applied as in Experiment A with the addition of the promise of extra leave to all men who were taking part in the experiment. Two additional assessments were interposed in the course of the fatiguing exercise and a final assessment was made at the conclusion of the experiment.

Rifle firing assessment—Immediately after each obstacle course assessment the subjects proceeded to a specially constructed rifle range. In Experiment A firing was from 4 numbered points with sandbag rests at a range of 100 yards. In groups of four, the subjects fired 10 rounds rapid fire and scores were assessed so that the maximum possible score was 50. In Experiment B the subjects in groups of six fired a grouping practice of 5 rounds at 100 yards. The customary grouping scoring system was used; all 5 rounds had to be on the target to score and the maximum score was 25.

The fatiguing exercise—In Experiment A the fatiguing exercise lasted for just over 17 hours. During this time the subjects took part in a tactical advance at the double over harrowed fields which were frozen and difficult to traverse, dug themselves in on an open hillside and marched a total distance of 40 miles. Twenty-six miles of the march were on smooth hard surfaced roads and the remaining 14 miles on steep narrow winding mountain paths which were frozen underfoot making progress difficult. In the course of the fatiguing exercise the subjects were allowed one hour's rest and ate one small meal. One hour before the exercise was scheduled to end each subject was issued with a box containing 3 capsules. The capsules in half of the boxes contained 5 mgm of benzedrine per capsule; those in the other half 5 mgm of calcium lactate per capsule. The identity of the capsules was not revealed to either the subjects or the ad-

ministrative personnel of the experiment until its conclusion

In Experiment B the fatiguing exercise lasted for 56 hours, and consisted of day and night marches over rough mountain paths as well as on gravel surfaced roads, "bushwhacking" through mountain woods and thickets, digging communication trenches, lectures, battle drill, attack exercises over rough brush, swamps and ploughed land and riding in trucks over rough uneven country. They marched a distance of over 50 miles, 32 of which were on gravel surfaced roads and the remaining distance of over 18 miles on rough mountain paths and through uncut underbrush. In addition, the subjects completed the obstacle course three times during the exercise. In the course of the 56 hour period of the exercise, the subjects were allowed divided rest periods totaling $7\frac{1}{2}$ hours, but sleeping was not possible for more than $4\frac{1}{2}$ hours of this time. On each of the 3 days of the exercise, the subjects were allowed one full meal and two additional light meals consisting of coffee and one or two sandwiches. Within the last 24 hours of the exercise, 5 issues of capsules were made to the subjects at different times, the last capsules being taken 2 hours before the final obstacle course and rifle firing assessments were made. The subjects did not know when the exercise was to conclude until the final obstacle course assessment was made. Within a twenty-two hour period, one group of 50 subjects took a total of 30 mgm of benzedrine, a second group took 35 mgm of benzedrine and a third group 35 mgm of calcium lactate. As in Experiment A, the identity of the capsules was unknown to any of the persons taking part in the experiment until after its conclusion.

RESULTS

Experiment A

(a) *Objective results*—The average times to complete the obstacle course by each group were as follows

Group	Average time to complete obstacle course	
	Fresh state	Fatigued state
Control (50 subjects)	166.9 secs	162.1 secs
Benzedrine group (48 subjects)	170.8 secs	153.6 secs

The ratios of the times taken to complete the obstacle course in the fresh state and in the fatigued state were calculated for each subject. The mean values and standard deviations of these ratios were

Group	Mean value of ratios of times for
	$\frac{\text{Fatigued state assessment}}{\text{Fresh state assessment}}$
Control	0.988 = ($\sigma = 0.111$)
Benzedrine	0.942 = ($\sigma = 0.236$)

The chance that the observed difference in the means of these ratios could have resulted by random sampling from the same population as determined by "students" test was found to be 1 in 5. Such a chance represents a statistical significance below the normally accepted standard for tests of this type.

The figures for the rifle assessment were also analyzed and no statistically significant difference was found between the scores of the control and benzedrine groups.

(b) *Subjective results*—The replies to three questions, which each subject was required to answer, were as follows:

Question "Did you notice any effects after taking the tablets?"

Answers

	Benzedrine group	Control group
Positive answer	17—(35.4%)	6—(12.5%)
Negative answer	31—(64.6%)	42—(87.5%)

Question "How did you sleep last night?"

Answers

	Benzedrine group	Control group
Well	38—(49.0%)	45—(90.0%)
Badly	10—(21.0%)	5—(10.0%)

(a) *Objective results*—The average times to complete the obstacle course by each group were as follows

Group	Average time to complete obstacle course			
	1st assessment	2nd assessment	3rd assessment	4th assessment
Control	162.9 sec	173.4 sec	185.5 sec	191.2 sec
Benzedrine (30 mgm)	163.9 "	168.9 "	178.9 "	182.7 "
Benzedrine (35 mgm)	163.7 "	172.3 "	181.0 "	187.6 "
Benzedrine (combined groups)	163.8 "	170.6 "	179.9 "	185.2 "

The ratios of the times over the obstacle course in the 2nd, 3rd, and 4th assessments, to that in the 1st (fresh state) assessment was selected as being indicative of a man's relative efficiency as the exercise progressed. These ratios were calculated for each man. The mean value and the standard deviation of these ratios for each group are tabulated below.

Group	Mean value of ratios of times for		
	2nd assessment 1st assessment	3rd assessment 1st assessment	4th assessment 1st assessment
Control	1.063 (0=0.0635)	1.135 (0=0.1085)	1.179 (0=0.1160)
Benzedrine (30 mgm)	1.031 (0=0.0618)	1.095 (0=0.0829)	1.120 (0=0.1105)
Benzedrine (35 mgm)	1.051 (0=0.0582)	1.101 (0=0.1080)	1.145 (0=0.1180)
Benzedrine (combined groups)	1.041 (0=0.0607)	1.100 (0=0.0958)	1.133 (0=0.1140)

On applying "students" test for the significance of the difference of mean values of the above ratios it was found that the chances that the two benzedrine groups (0 and 35 mgm) could have been drawn by random sampling from the same population were 1 in 11, 15 and 7 in the 2nd, 3rd and 4th assessments respectively. It was therefore considered permissible to combine both benzedrine groups to form one group of 100 subjects. (Mean values and standard deviations of the above ratios for this combined group are presented in the above table.)

The combined benzedrine group was then compared with the control group. By testing for the significance of the differences of the mean values of the above ratios, it was found that the chances that these two groups could have arisen by random selection from the same population were 1 in 24, 23 in 15 and in the 2nd, 3rd and 4th assessments respectively. The significance of these chances is discussed below.

The rifle firing scores failed to show any statistically significant difference between the control and benzedrine groups.

(b) *Subjective results*.—The following information was obtained from a questionnaire which

	Benzedrine groups		Control group
Number of subjects at the end of the week —	35 mgm calcium lactate		
Very tired			
Slightly tired	2	5	16
Not at all tired		10	2
Number of subjects who felt that they were —			
Helped by the capsules	85	77	66
Hindered by the capsules	4	2	4
Unaffected by capsules	11	21	30

each subject was required to answer at the conclusion of the experiment.

THE EFFECT OF BENZEDRINE ON MENTAL FATIGUE IN SOLDIERS

Test subjects.—The subjects used in this experiment were 3 officers in their last week of a Canadian War Staff Course. One-third of the officers had been serving in the active forces since the outbreak of the war in 1939 and the remainder had over 2 years' service. About four-fifths of the group had some staff experience in the junior grades such as staff learners or liaison officers in a field or static formation.

These subjects could not be categorized as staff officers at the time of investigation, as they were not then holding staff appointments. However, it was the opinion of responsible senior officers that if these officers were employed at staff duties over a prolonged period they would reproduce an approximately similar degree of mental fatigue to that of staff officers under the same circumstances.

The subjects were divided into 3 groups: one group of 25 subjects was issued with benzedrine as outlined under "procedure"; a second group of 25 subjects was issued with an inert control substance (calcium lactate); and a third group of 23 subjects was untreated. The 3 groups were carefully chosen so that, as far as possible, each contained an equal number of subjects of outstanding average, and poor ability. This classification was based on a system of grading compiled by the Directing Staff as a result of 4 months' knowledge of the students' capabilities.

While each of the subjects worked as an individual, for purposes of assessment they were grouped in 7 syndicates each consisting of 10 or 11 subjects. Each syndicate was under the direction of a General Staff Officer (GSO II) who acted as adjudicator for his syndicate. The syndicates were so composed that the GSO II was thoroughly familiar with the personality, capabilities and usual standard of work submitted by each member of his syndicate.

Procedure.—Over a period of 72 hours, the 73 subjects were required to complete a program consisting of 9 exercises in staff duties, some longer and more complex than others. The exercises were designed and the times for submitting so arranged that the subjects had to work hard to complete the various parts on time. Conferences were held on these exercises at frequent intervals and reports had to be

handed in at specified times over the test period of three days. All the written exercises were held in rooms with 10 to 11 subjects to a room. During the first 42 hours there was no opportunity for sleep. In the last 30 hours there were 2 periods, one of 6 hours and one of 4 hours, during which the subjects could leave the rooms and do as they wished on the understanding that the next report was handed in on time.

At intervals between the 32nd and 42nd hours, a number of capsules were issued to 50 of the subjects so that 25 of them got 20 mgm of benzedrine each and 25 an inert substance (20 mgm of calcium lactate). A similar dosage was issued between the 56th and 66th hours. The total amount of benzedrine issued to each man in the benzedrine group was 40 mgm. Twenty-three subjects were untreated. All the capsules were identical in appearance and no one participating in the experiment, either as subject or administrator, was aware which subject got benzedrine and which the control substance.

The results were assessed by adjudicating staff officers with a view to determining whether the military efficiency of each subject, as judged by the standard of his work, deteriorated, improved or remained unchanged with the progress of the experiment. Military efficiency was defined as "the ability of a subject to complete the staff problems set him in a satisfactory manner." To decide whether there had been any alteration in military efficiency, the work of each subject was compared with (a) the standard to be expected from him as judged by his performance during the previous four months, and (b) the standard of work submitted by him in the earlier stages of this experiment.

In this respect attention was paid to factors such as method of expression, judgment, hand writing or typing, the behaviour of the subject at the conferences, his alertness, apathy, evidence of lack of judgment etc. Throughout the experiment a continuous record was kept of the performance of each subject.

At the end of the experiment, in addition to an opinion as to the state of military efficiency, each adjudicator was required to give an estimate as to the degree of fatigue developed in each subject in his syndicate, and whether he had reason to conclude that the subject was affected by an analeptic or not. An accurate record of the amount of sleep taken by each subject throughout the trial was also required.

These observations comprised the objective part of the assessment. The more important of them were treated statistically and the final conclusions of the investigation were based on the result.

Subjective data were compiled from a questionnaire completed by each subject, 48 hours after the end of the experiment. On this, he was required to say whether he was severely fatigued by the exercise or not, whether he was aware of any effects after taking the capsules, if he considered they helped him or hindered him in his work, whether they had any effect on sleep and would he make use of them again under similar circumstances.

RESULTS

(a) *Objective results*—(Observations made by the Adjudicators)

<i>Number of subjects whose military efficiency (capacity to complete problems set them in a satisfactory manner)</i>	<i>Benzedrine group</i>	<i>Control group</i>	<i>Untreated group</i>
Improved during the experiment	1 (4.5%)	0	0
Remained unchanged during the experiment	11 (50.0%)	9 (43.0%)	4 (21.0%)
Deteriorated during the experiment	10 (45.5%)	12 (57.0%)	13 (78.0%)
Number in each group	22	21	17

In compiling the above figures, only subjects whose standard was equal to that required of a Staff Officer were included.

Calculated on the assumption that the proportion of those whose military efficiency deteriorated during the experiment was unaffected by the taking of any capsules, the probability of results being obtained by random sampling such as those found in the benzedrine and the untreated groups, would be approximately 1 in 4. Therefore, it must be concluded that benzedrine had no effect in preventing deterioration of military efficiency under the conditions of this experiment.

Similarly, by random sampling there would be approximately an even chance of obtaining results such as those found in the benzedrine and control groups and the control and untreated groups.

	<i>Benzedrine group</i>	<i>Control group</i>	<i>Untreated group</i>
<i>Number of subjects who during the entire experiment did not sleep (These observations were made only on 4 syndicates, involving 42 subjects)</i>	7 (50%)	4 (27%)	3 (23%)

The probability of obtaining such results by random sampling would be considering the benzedrine and untreated groups, approximately 1 in 4, considering the benzedrine and control groups approximately 1 in 3, considering the control and untreated groups, approximately even

	Benzedrine group	Control group	Untreated group
Number of subjects who slept less than 3 hours or did not sleep at all (These observations were made on only 42 subjects)	13 (47%)	9 (30%)	6 (23%)

The probability of obtaining such results by random sampling would be considering the benzedrine and untreated groups, approximately 1 in 7, considering the benzedrine and control groups, approximately 1 in 3, considering the control and untreated groups approximately even

These probabilities represent a significance below that normally accepted for tests of this type. Therefore, it must be concluded that benzedrine in the doses given had no statistically significant effect in preventing sleep in the present experiment

	Benzedrine group	Control group
Number of subjects in each group whose performance and appearance led the adjudicators to believe they had taken an analeptic	15 (60%)	8 (32%)
Number of subjects in each group who in the opinion of the adjudicators were helped by the capsules hindered by the capsules	11 (56%) 1	8 (32%) 0

*Adjudicator's comment "drug appeared to give false idea of capabilities and false optimism"

(b) *Subjective results*—(Observations made by the subjects)

	Benzedrine group	Control group
Number who felt they were helped by the capsules	21 (84%)	16 (64%)
Number who felt they were hindered by the capsules	1 (4%)	1 (6%)
Number who felt they were unaffected by the capsules	3 (12%)	5 (20%)
Number who believed that the capsules helped to keep them awake	21 (84%)	7 (28%)
Number who, if faced with 3 days continuous work, would like to take similar capsules	19 (76%)	11 (56%)

None of the differences between the two groups is statistically significant

DISCUSSION

The use of an obstacle course to assess the effects of benzedrine on progressive fatigue, be-

cause of the insensitivity of the method, can not be expected to give worthwhile information, unless there is a marked difference in the times returned by the two groups under test. In Experiment A, there was evidence that benzedrine produced any effect in allaying fatigue. However, it must be emphasized that both control and benzedrine groups showed improved performance times in the fatigued state. This apparent anomaly can be explained by the fact that the times returned in the fresh state assessment were abnormally long as a result of lack of familiarity with the course. The reduced times for the second assessment reflect the influence of the experience obtained in negotiating the course in the previous assessment, which was sufficient to offset the effect of fatigue on the performance times. In Experiment B, the subjects were familiarized with the obstacle course by several previous practice runs and other undesirable factors which might influence the performance time of the subjects such as knowledge of the time at which the experiment was scheduled to end, were eliminated.

In biological experiments it is usual to regard a chance of 1 in 100 as statistically significant although sometimes a level as low as 1 in 20 is considered to be a threshold value. On this basis, the results of Experiment B, which indicated that the chances of the two groups being drawn by random sampling from the same population were 1 in 24, 23 in 45 in the 2nd, 3rd and 4th assessments respectively, suggest that benzedrine may have had some influence on the ability of the subjects to return better times over the obstacle course compared with a control group. However the difference between the control and the benzedrine groups was not of a highly significant nature and from a practical standpoint, the relative improvement in time can be disregarded.

There was no evidence from the answers submitted by the subjects to the questionnaire in either experiment that any degree of wakefulness of practical importance was induced by benzedrine.

The observations of the effects of benzedrine on mental fatigue did not indicate that the drug had an influence in averting deterioration in military efficiency in the sense used in this experiment that is, the capacity to complete a specific problem in a satisfactory manner. As in the experiments on physical fatigue, benze-

drine in the doses used, was not shown to prevent sleep in any appreciable degree

Undesirable side effects of benzedrine have been reported by many investigators, the commonest being dizziness, headache, increased depression and lassitude, anxiety and tenseness, nervousness and irritability. Temporary confusion after 30 mgm has been reported in normal subjects⁴. In this investigation, the adjudicators were instructed to note particularly any evidence of impairment of judgment which could not reasonably be attributed to fatigue. Only one instance of this nature was recorded. The adjudicator commented that the subject

"appeared to develop a false idea of his capabilities and false optimism." There is some evidence however that this officer under normal conditions possessed an unstable judgment. The only untoward effects noted amongst the benzedrine group were palpitation, secondary depression (two cases), headache and "light-headedness", feeling of "tightness around the head" and slight indigestion and intestinal discomfort. All those symptoms have been frequently noted before and in this experiment none of them was of any consequence. Several complaints of headache and depression were made by subjects in the control group. The main conclusion to be drawn from these observations is that under the conditions of this experiment, 40 mgm of benzedrine given within a period of 34 hours had no deleterious effect on judgment, and any other side effects were trivial and of little consequence.

SUMMARY

Fifteen mgm of benzedrine given to soldiers taking part in physically fatiguing exercises lasting for 17 hours did not enable them to return significantly better performance times over an obstacle course compared with soldiers treated with an inert control substance.

Thirty-five mgm of benzedrine given in divided doses over a period of 24 hours to soldiers taking part in physically fatiguing exercises lasting for 56 hours did not enable them to show a worthwhile improvement in the times taken to negotiate an obstacle course compared with soldiers treated with an inert control substance.

Forty mgm of benzedrine given in divided doses over a 34-hour period to officers taking part in staff problems lasting for 72 hours has no significant effect on military efficiency com-

pared with officers who took an inert control substance or who were untreated.

There was no evidence in these experiments that benzedrine in the doses mentioned above tended to prevent sleep. No side effects of any significance were caused by these doses.

The findings of these three experiments did not warrant a recommendation that benzedrine should be provided to soldiers for the purpose of averting physical or mental fatigue.

Thanks are due to Dr. B. A. Griffith and Lieut. Reed H. Johnston who carried out the statistical analyses.

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RÉSUMÉ

L'administration de 15 mg de benzedrine à des soldats soumis pendant 17 heures à des exercices fatigants ne leur permit pas de terminer plus rapidement une course à obstacles que les soldats témoins à qui l'on avait administré une poudre inerte. L'administration de 35 mg de benzedrine à des soldats soumis pendant 24 heures à des exercices fatigants ne leur fit pas accomplir mieux et plus rapidement une course à obstacles que ceux à qui l'on ne donna qu'un simulateur de benzedrine. L'administration de 10 mg de benzedrine, à doses fractionnées, pendant plus de 31 heures à des officiers participant à des problèmes d'état-major qui durèrent 72 heures n'eut pas d'effet appréciable si on les compare à ceux qui l'on observa chez d'autres officiers qui ne reçurent pas de benzedrine. Rien ne démontra au cours de ces expériences que la benzedrine a des effets anti-hypnotiques. Aucune réaction désagréable ne fut signalée. En somme, rien ne permet de recommander la benzedrine pour prévenir la fatigue physique et psychique des militaires. JEAN SAUCIER

CLINICAL OBSERVATIONS ON THE USE OF BENADRYL, A NEW ANTI-HISTAMINE COMPOUND

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BENADRYL (B dimethylaminoethyl benzhydryl ether hydrochloride) is a fairly recently synthesized chemical compound possessing at least three significant pharmacological actions.

1. It relieves bronchial constriction caused by histamine or anaphylactic shock. E. R. Loew¹ and his associates have demonstrated that benadryl is from fifteen to thirty times as active as aminophylline in relieving bronchial constriction in histaminized guinea pigs. In a control group the untreated animals all died, with adequate doses of aminophylline the mor-

tality rate was 47%, with adequate doses of intraperitoneal benadryl the mortality rate was nil

2 It alleviates spasm of smooth muscle. Studies on its anti-spasmodic action on smooth muscle revealed that it is 650 times more effective than papaverine in antagonizing histamine, 50 times more effective in antagonizing acetylcholine and 13 times more effective in antagonizing the contractile effects of barium chloride.

3 It decreases the vasodilator effect of histamine. McElm and Horton² have demonstrated this by producing a cutaneous blush on the face and upper chest by the continuous steady intravenous administration of a 1/250,000 solution of histamine. During the course of the histamine injection benadryl was administered in another vein. The blush reduced quickly and remained thus in spite of the continued administration of histamine. Further clinical physiologic studies by McElm and Horton² revealed that benadryl alleviated the nasal congestion artificially produced by histamine administration (vasodilation of mucous membrane). They have shown that it can decrease

allergic diseases. The dilatation of the nasal mucous membrane in hay fever and vasomotor rhinitis, the skin wheals of urticaria, the overdistension of the membranous labyrinths by oedema in Ménière's disease, the vasodilating feature of certain flushing headaches and the superficial cutaneous pain of myalgia of the head can all be considered to be caused by histamine release.

The clinical use of benadryl in the above mentioned diseases is then apparently justified by virtue of its marked anti-histamine properties coupled with the fact that *per se* it has rather low pharmacological activity. Atropine, for example, has certain anti-histamine effects but its cholinergic response is far more active and occurs before its anti-histamine effect is produced.

The first written report on the clinical use of benadryl was by Curtis and Owens,⁶ published in April, 1945. They treated eighteen cases of acute and chronic urticaria. Prompt relief was noted in eleven cases, definite improvement in three and no benefit in four. O'Leary and Farber⁷ treated fifteen cases who had acute urticaria for an average of sixteen

TABLE I

<u>Site of action</u>	<u>Effects produced</u>	<u>Important organs affected</u>
Smooth muscle	Contraction	Bronchiolar, intestinal vascular and uterine smooth muscle
Capillaries	Dilatation and increased permeability	Skin and mucous membrane
Glands of external secretion	Secretagogue	Lachrymal, nasal, pulmonary and digestive glands
Cutaneous endings of pain nerves	Pain	Skin

the acid response of gastric mucosa to histamine and that it can depress the wheal and flare response to cold sensitivity. Feinberg and Friedlander³ have recently demonstrated its usefulness in abolishing complicating dermatographism in skin testing.

To understand the rationale of benadryl therapy one must bring to mind the more important properties of histamine. It was in 1910 that Dale and Laidlaw⁴ published their classic report on the physiological action of histamine. Code⁵ has summarized the more important of these properties under the headings: site of action, effects produced and important organs affected.

A study of the above table will indicate why the liberation of histamine or histamine-like substance is considered to be the factor responsible for the clinical manifestations of

days. Nine experienced immediate relief, five improved and one showed no benefit. The same authors treated thirty-five cases of chronic urticaria, the average duration being four years. Twenty-four of the thirty-five had angioneurotic oedema as well. Their results were gratifying. The lesions of twenty-five disappeared completely except for a few non-pruritic hives in some, seven patients were definitely improved and three were not benefited. Except for one patient there was prompt recurrence of the urticaria when placebos were administered or benadryl discontinued. It was possible in some cases to reduce the daily dose of benadryl and in one case there was no recurrence after several months discontinuance of the drug. The authors consider that in the light of their experience benadryl is highly ef

fective in the symptomatic treatment of urticaria and angioneurotic edema

McElm and Horton² treated twenty-two cases of urticaria with an excellent response in nineteen, a good result in two and no improvement in one. In three cases of Menière's disease classified by them as (a) early, (b) early with urticaria and (c) early with urticaria, hay fever and headache excellent response was obtained in all. Four cases of tension headache with vasodilating features showed marked response to benadryl. The drug was used intravenously in some of the acute hay fever cases with a dramatic response in about thirty seconds. They used 60 mgm per 100 cc of physiological saline at the rate of 120 drops per minute. The oral route, however, is the commoner and more practical avenue of administration and the response they found, though not so dramatic as the intravenous method was usually very prompt.

Koelsche and Prickman⁸ in their paper report the results of treatment of fifty-two patients with hay fever. Thirty-nine patients (75%) reported benefit while thirteen (25%) reported no benefit. Of the thirty-nine patients benefited ten obtained almost complete relief, nineteen claimed 75% and ten reported 50% relief. In a group of nineteen cases of hay fever and bronchial asthma, fourteen claimed benefit while five reported no relief. In twelve cases of bronchial asthma the results were not very encouraging. Four reported benefit and eight claimed no relief. They consider that the results achieved in the symptomatic treatment of hay fever by benadryl justify its further trial. In the treatment of bronchial asthma it is obvious that a great deal of further study must be done before any definite statement can be made on the therapeutic value of benadryl. G. B. Logan⁹ observed the results of benadryl in the treatment of eighteen children afflicted with asthma, hay fever, vasomotor rhinitis, urticaria and serum reactions and claims that if an adequate dosage is used benadryl can be considered to be a useful drug in these conditions. It has been found very effective in drug eruptions, notably urticarial reaction to plasma, penicillin and various antitoxins.

DOSAGE

Benadryl is prepared in capsule and elixir form. The capsules are 50 mgm and the elixir contains 10 mgm of benadryl per 4 cc. There

is no set dose but it is generally considered that for adults the starting dose should be one capsule (50 mgm) three times a day. This can be either increased or decreased as determined by clinical response. As before mentioned it can also be given intravenously. The low toxicity of the drug allows a certain amount of leeway in its administration.

UNFOWARD EFFECTS

By far the commonest side effect is a slight drowsiness which very seldom interferes with the patient's daily routine. Other reactions of less frequency which have been reported are dizziness, dry mouth and a feeling of nervousness.

CASE HISTORIES

CASE 1

Mr A M, aged 25, farmer
Tension headache with vasodilation features. History of headache and flushing of face occurring nearly every day precipitated or aggravated by emotional tension. Duration of symptoms 10 years. Physical examination revealed nothing of note except marked dermatographism. He was put on benadryl 50 mgm three times a day. For past month he has had no headache or flushing except for two days when he was unable to procure the drug. After two weeks it was found that two capsules a day were sufficient to control the headache and flushing.

CASE 2

Mrs H D, aged 36, housewife
Vasomotor rhinitis, duration 12 years, most marked in morning when she always had violent sneezing at ticks. For past month one capsule of benadryl at bedtime has afforded complete relief.

CASE 3

Mrs E B, aged 57, housewife
This woman gave a history of allergy to grain dust for about ten years. She was quite sensitive to flour and would always have sneezing episodes while baking bread. Skin test was very positive to wheat dust. One capsule of benadryl one hour before baking controls symptoms.

CASE 4

Miss H P, aged 25, teacher
Chronic urticaria and food idiosyncrasy. History of hives since childhood almost every day in greater or lesser degree. For the past four years eating of strawberries always caused stomach cramps and nausea. She was put on benadryl 50 mgm three times a day and told to eat two large servings of strawberries every day for a week. At the end of one week she reported that she had no recurrence of hives and was able to eat strawberries without any ill effects. She was observed for a period of one month and during that time had no recurrence of symptoms.

CASE 5

Mrs W G, aged 43, housewife
Very sensitive to potted plants all the year round, especially geraniums and nasturtiums. She would immediately experience nasal itching and sneezing when in the environment of these plants. On benadryl 50 mgm twice a day she was able to insert geranium leaves in her nostrils without ill effect.

CASE 6

Mr ES, aged 30, farmer
Acute grant hives, no previous occurrence Benadryl 50 mgm three times a day over a period of four days had no effect either on itching or duration of lesions

CASE 7

Miss MC, aged 20
Hay fever for past three years Patient was in throes of a severe attack while in office Benadryl 50 mgm gave relief in about half an hour For past two weeks she had been on 50 mgm, three times a day with complete relief of symptoms

CASE 8

Mr HB, aged 40, farmer
Vasomotor rhinitis of two years' duration The history, symptoms and signs of this case suggested that it should be very amenable to benadryl therapy but the results were disappointing On benadryl 50 mgm three times a day he claimed no relief

CASE 9

Mr AG, aged 58, farmer
Chronic rhinitis, duration 10 years This man gave a history of a persistent chronic cold in the head aggravated by a dusty environment For the past month he has been free from symptoms on benadryl 50 mgm twice a day

CASE 10

Miss AB, aged 6
Grant hives, serpiginous and circinate, acute in onset Benadryl 50 mgm effected relief of itching in about 10 minutes Although pruritus was completely controlled it did not seem to have any effect on the duration of the hives

CASE 11

Mrs OG, aged 45, housewife
Vasomotor rhinitis and grant urticaria This patient presented the most marked symptoms of the chronic cases described For fifteen years she suffered from continual "sniffles" and presented a classical case of grant urticaria which occurred on the average of three times a week most often precipitated by emotional upset She was put on benadryl 50 mgm three times a day with immediate relief of symptoms After two weeks the therapy was cut down to 50 mgm twice a day and this has held her nicely She has been under observation for four months and has had no recurrence of either condition The result is rather remarkable considering the severity and duration of her symptoms

The above cases are detailed in an attempt to illustrate the fact that they represent symptom-complexes which are generally considered to be allergic in nature and which are assumed by many to be caused by histamine release The diagnoses for the most part are purely clinical but present little doubt The results achieved by benadryl therapy would seem to indicate that this new anti-histamine drug rates a fair trial in the symptomatic treatment of allergic diseases

SUMMARY

1 A short review of the available literature on benadryl is presented

2 Physiological and pharmacological studies have shown it to have marked anti-histamine properties and low toxicity

3 Clinically it has been found to be a useful drug in the symptomatic treatment of diseases assumed to be caused by histamine release

4 Case histories illustrating its effect in the treatment of some common allergic diseases are presented

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RESUMÉ

Présentation d'un résumé des travaux accomplis avec le benadryl Les études poursuivies sur ce produit démontrent que des points de vue physiologique et pharmacologique il possède une action anti-histaminique très nette et qu'il est peu toxique Le benadryl est un produit qui rend des services incontestables dans le traitement des états dont l'étiologie présumée est attribuable à une hyperproduction d'histamine Des histoires de cas résumées témoignent de quelques maladies allergiques fréquentes qui en ont bénéficié

JEAN SAUCIER

VEIN LIGATION IN THE PREVENTION OF PULMONARY EMBOLUS

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IF one may be permitted to apply to Canada the conclusions of Collins, which are based on 10,940 consecutive autopsies, one may say that about 200,000 Canadians now living will die of a pulmonary embolus About 2.07 to 2.72% of all deaths are due to this condition and occur in patients suffering from medical conditions as well as those who have sustained an injury, or have given birth to a child or undergone a surgical operation¹ In fact the condition is found as frequently in those who have been confined to bed for medical reasons as in post-operative cases About 25% of patients have a single fatal embolus, 50% have a single non-fatal embolus and 25% have multiple emboli,

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60% of this last group ultimately succumb to a fatal pulmonary infarction.² Three quarters of the cases having a fatal pulmonary embolus are over fifty years of age.³ Gibbons states that one of every thousand cases admitted to a surgical ward will die of a pulmonary embolus, and two of every thousand postoperative cases will die from this complication, and, finally, that 8% of all postoperative deaths are due to this condition.⁴

These mortality figures are impressive but, in the tragic drama of the fatal embolism, one is inclined to overlook the prolonged and costly invalidism which is associated with the more numerous sublethal pulmonary infarctions and the permanent partial disability resulting from the extensive deep vein obstruction in the lower extremity.

The origin of these devastating emboli is a matter of great practical importance. Some undoubtedly escape from the heart. The following case is one in which the fibrillating auricles were believed to harbour thrombi, some of which became detached.

FJ, female, aged 48. On February 16, 1946 this patient was admitted to the Vancouver General Hospital for the treatment of a pharyngeal diverticulum. She had had chronic myocarditis and auricular fibrillation for years. On February 18, a gastrostomy was done for the purpose of feeding the patient. She had gained weight rapidly till March 3, when she experienced a sudden severe pain in the right chest. This was followed closely by the expectoration of bloody sputum and the appearance of a well marked pleural rub in the right axilla. The radiogram failed to show an infarction due, probably, to the increased basal shadows resulting from long standing chronic passive congestion. The onset of chest symptoms was accompanied by head ache, giddiness and slight mental confusion. She had a slight fever for 24 hours and after three days she was symptom free.

Possibly a few clots escape from the region of the wound. The story of the following patient suggests that his embolus arose from this area.

GM, male, aged 26. This patient was admitted to the Vancouver General Hospital on February 15, 1946 with a diagnosis of acute appendicitis and was operated upon the same day. On February 21, he developed pain in the right lower chest, associated with blood stained sputum. X ray revealed what appeared to be an infarction in the right lower lobe. His temperature rose to 100 degrees on the day of onset and gradually subsided during the following four days. At no time during the next several weeks could any evidence of thrombosis be found in the veins of the lower extremities or in the pelvis. No cardiac disturbance was present so it was assumed that the embolus arose at the site of operation.

But the main source of pulmonary embolus is undoubtedly from the veins of the lower limbs, 95% of emboli, other than those of

cardiac origin, arise here.⁵ Frykholm has shown that incipient intravascular clotting occurs most frequently in the calf muscles and especially in the veins of the soleus muscle. The adductor muscles of the thigh are the second greatest offenders in this respect. They are involved two or three times less frequently than those muscles in the legs. In a small percentage of cases incipient thrombosis can be found in the plantar and malleolar veins and in the pelvic veins.⁶ From these beginnings the thrombi tend to propagate themselves proximally into the larger channels and involve the posterior tibial, the popliteal, the femoral and iliac veins. One can anticipate that 15% of patients with phlebitis will have pulmonary emboli⁷ and, of those patients who have recognizable phlebitis, 4% will have a fatal embolus.⁸

Why blood should clot in the veins in these cases is by no means clear. Possibly there is some change in the chemistry or cellular elements of the blood itself which has not, as yet, been explained. Since the brilliant studies of Asehoff there has been a strong feeling that a sluggish blood flow tends to promote intravascular clotting. Devotees of this theory encourage early active muscular exercises, deep breathing and even posture to prevent the blood from stagnating in the leg veins. Frykholm believes that the Trendelenburg position and the pressure of pillows on the calves and adductor regions produce empty collapsed veins. The opposite walls of the vessel thus being in contact the delicate endothelial lining is damaged and clotting ensues. On the basis of this theory he raises the head of the bed in order that the veins of the lower extremities may be continuously distended with blood as they are in the normal erect position.⁹

But whatever theories are held the fact still remains that intravascular clotting does occur. Many of these cases, whether recognized or not, remain local and heal. When this most desirable sequel fails to take place one of two courses may result. The initial coagulation thrombus in a small vein may propagate itself rapidly through the deep venous channels to the groin, giving rise to obstruction with acute symptoms of severe pain and swelling simulating femoro-iliac thrombophlebitis, the familiar phlegmasia alba dolens. Bauer believes that 90% of cases of femoro-iliac thrombophlebitis begin in this way, even though the initial lesion

in the calf may not be recognized.² If this occurs emboli need not be feared, since the clot is adherent. If the patient does suffer a pulmonary infarction one should suspect the opposite limb. In these cases there is a perivascular inflammation involving the lymphatics, the artery and the vein. The pain, swelling and nutritional changes are due to arteriolar spasm and the treatment is lumbar sympathetic block. Because of the extensive deep vein thrombosis chronic swelling of the extremity can be expected. The following case illustrates this type of lesion and the dramatic effects of this form of therapy.

M G, male, aged 40. This soldier gave a typical history of phlebitis in the left leg while a prisoner of war in Japan in 1943. He had made a complete recovery from his attack. On October 1, 1945, while en route to Canada he developed a right sided pleurisy with effusion and a corresponding pneumonic process in the right middle and lower lobes. His chest lesion gradually cleared but on November 12, 1945, his left leg began to swell. When examined on November 13, 1945, it was definitely swollen and he was tender over the femoral sheath. During the next four days the extremity became enormously swollen and the urinary output sharply curtailed. Beginning on November 20, 1945, the left lumbar sympathetic chain was blocked on two successive days. The extremity immediately began to decrease in size and the urinary output became greater than the fluid intake. In a week the swelling had disappeared and the patient was evacuated to his home in Eastern Canada on December 18, 1945.

The most dangerous course, however, is the less obvious pathological condition which has been called by Osehner phlebothrombosis and by Homans bland or quiet thrombosis. This is subtle and insidious in its onset and development. There may be no warning symptom or sign of its presence until the individual has suffered a pulmonary embolism. Often the patient may complain of a slight pain in the calf or there may be a slight unexplained rise in temperature. But, for the most part, its recognition before the clot breaks away depends on routine observation of the legs in anticipation of such a complication. Many patients present pulmonary and cardiac symptoms which are variously diagnosed until, much later, the true nature of the condition is made clear by the appearance of chronic permanent swelling of the lower limb. Clinically the calf is tender and Homans' sign is positive. There may be some oedema about the ankle, the superficial veins may be slightly distended and cyanosis of the foot may be observed when the patient stands. As compared with femoro iliac

thrombophlebitis the pain and swelling are trivial.

The actual lesion consists of a coagulation thrombus adherent at its origin to a small vein in a calf muscle and slowly propagating proximally through the deep veins of the leg and thigh. This subsequent addition to the original clot floats freely in the blood stream of the deep veins and fails to obstruct them in the early stages. Later there is usually some adhesion to the vein walls and obstruction to the passage of blood in their lumina eventually becomes complete. The longer the thrombus and the more freely it floats in the vein the more likely it is to escape from its mooring, pass through the heart and plug a pulmonary artery. A loose thrombus in the femoral vein is particularly ominous because of the length of clot it may contain.

The following case illustrates the subtle nature of the process and the permanently disabling nature of the obstructive lesion in the deep veins of the lower extremity.

J J L, male, aged 35. In March 1942, while suffering from an upper respiratory infection, this officer sprained his right ankle. After three or four days in bed he noticed that his feet were swollen, his legs blotchy and that he had some pain in his calves. A month passed with little change in his condition when suddenly he experienced a severe pain in his chest which was closely followed by the expectoration of bloody sputum. A diagnosis of bronchopneumonia was made. Within a fortnight his entire left lower limb became markedly oedematous and painful. When this was subsiding the process was repeated in the opposite leg and thigh. He remained in hospital about three months and had no other pulmonary episodes. Since then both legs have been painful and chronically swollen. On one occasion they were the site of ulceration. There are no ulcers now but the swelling and pain remain.

This patient clearly illustrates the type of case so frequently seen in which the nature of the chest lesion is not understood and in which the subject is left with a permanent disability from deep vein obstruction. We believe that interruption of the superficial femoral vein at an early stage would have protected this man from the pulmonary embolus, which he undoubtedly had, and would also have arrested the obstructive process in the deep veins before it had destroyed the important collaterals in the femoro iliac region.

VENOUS LIGATION

In our small group of cases ligation was done in order, firstly, to anticipate the occurrence of pulmonary embolus, and, secondly, to arrest

and localize the extending clotting process in the deep veins of the limb

Only two sites for ligation were used. In those cases in which the process had not reached the groin the superficial femoral vein was doubly ligated and divided at its proximal end. When the thrombus had reached the region of the inguinal ligament it was assumed that the process had involved or possibly arisen in the profunda femoris and ligation of the common femoral below the entrance of the great saphenous vein was carried out. It has been shown that a better collateral circulation can be expected when the common iliac vein is ligated than when the common femoral vein is tied but our patients, who were candidates for this procedure, were too ill to undergo a major operation and to take a general anaesthetic. Further, it was felt that although emboli would be trapped, the thrombus could reasonably extend up to the site of ligation and cause marked venous obstruction. Ligation of the common femoral vein with aspiration of the thrombus above and below this region will arrest the process and even if emboli do occur above the site of division they will be too small to be lethal.

The reports on the following cases indicate what may be expected from deep vein ligation.

RCL, male, aged 26. On April 30, 1945, the right knee joint was opened for what was thought to be a torn medial meniscus. No tear was found and a normal cartilage was removed. About three weeks later the patient complained of slight tenderness in the right calf and Homans' sign was present. No immediate action was taken and a few days later on May 26, the patient suffered a right pulmonary embolus. On May 28, the right femoral sheath was exposed under local anaesthetic. The common, deep and superficial femoral veins were found to be free of blood clot. The superficial femoral vein was, therefore, doubly ligated and divided and the wound closed.

Following this procedure the signs of phlebitis rapidly subsided and he had no further pulmonary infarctions. One will never know whether the phlebitis would have continued to progress or if further emboli would have occurred had the operation not been done. The patient was protected however. He is now active as a painter and there is complete absence of swelling in his leg.

The next case was that of a man who was suffering from a ruptured intervertebral disc.

WM, male, aged 32. For the above condition Buck's extension with 15 pounds weight was applied to the right lower limb on October 14, 1945. This was constantly maintained till November 4, 1945. During

this period he was encouraged to move the leg as much as possible and his exercises were supervised daily by a physiotherapist. On being released from traction he was allowed up. It was then noticed that he had a peculiar limp and on further investigation it was found that the patient could not dorsiflex his ankle due to pain in the calf. The posterior compartment of the leg was swollen and tender and the muscles were in spasm. A venogram was done and found to be negative. Slight oedema was observed posterior to the malleoli.

Since neither the patient nor the staff were aware of this condition until the traction had been removed and walking attempted, it was difficult to judge how long the process had been present. In any case it was decided that the safest course was to divide the superficial femoral vein. This was done under local anaesthetic on November 7, 1945, after the three femoral veins had been examined and found to contain no thrombus. The day after the operation the phlebitis extended up the superficial femoral vein to the site of ligation. This vein could be palpated as a very tender, hard cord in Hunter's canal. Following this the acute symptoms and signs rapidly disappeared and the swelling also subsided.

It is unlikely that this patient would have had a pulmonary embolism if operation had not been done because the process was fairly acute. There is every reason to believe, however, that if the superficial femoral vein had not been interrupted, the progressive thrombosis would have reached the iliac veins and their branches leaving him with a permanently swollen leg. It is also noteworthy that bland phlebitis occurred at all in this case. His limb was constantly higher than his body permitting excellent drainage of the venous system and this drainage by gravity was assisted by active muscular exercises. It is apparent that in this case, at least, the incipient thrombosis was not due to stasis.

The following case is one in which the results are difficult to estimate.

KH, male, aged 29. This man was admitted to Vancouver Military Hospital on April 24, 1945, complaining of a deep ache in his right knee joint and a history of periodic locking. A diagnosis of a torn medial meniscus was made. Before operation was done the patient had a bout of pain in the right abdomen suggesting ureteral colic. A thorough investigation of the genitourinary tract and abdomen failed to show any lesion. On June 4, the right knee joint was opened, a bucket handle tear of the medial meniscus found and the cartilage removed. Two days later the patient developed tenderness in the right calf with signs characteristic of phlebothrombosis and the same day the veins at the groin were exposed and inspected. No evidence of thrombosis was found and the superficial femoral vein was ligated in continuity just below the entrance of the profunda branch.

Following the operation no extension of the phlebitis occurred but the patient complained of pain in his calf for a few weeks and finally pain in the outer side of his right knee joint. This last complaint has remained unexplained till the present with the result that he has refused to use his knee.

The operation may or may not have arrested the phlebitis but it is important to note that, in spite of muscular atrophy and a failure to use the limb, swelling

has not been an important feature. The affected leg is actually 2 cm larger than the unaffected side. Originally it was thought that, since the vein was ligated in continuity, sympathetic nerve disturbance might have caused this distress. However, there was no evidence of vasospasm and lumbar sympathetic block failed to relieve the pain.

Other causes of non-fatal pulmonary embolus arising from phlebothrombosis, which had not extended beyond the calf and for which superficial femoral ligation had been done, might be reported but they would illustrate nothing more than has already been shown. As will be understood, this type of ligation is suitable for the case in which the lesion is relatively early and still confined to the area drained by the superficial femoral vein.

The following ligations were done for cases which were more severe and extensive and, for the most part, later in the course of the disease.

TC, male, aged 49. On November 24, 1945, this man had a partial gastrectomy for pyloric stenosis due to a duodenal ulcer. The following day a right sided atelectasis was diagnosed. Nine days after his operation the wound broke down and had to be resutured and the same day it was noticed that the right leg was swollen. By December 5, his right foot was cyanotic, he was tender in the calf and the right thigh was becoming oedematous. Both the great saphenous vein and the femoral vein in Hunter's canal could be palpated as hard tender cords. At operation the same day these veins were found completely occluded by clot. The common femoral vein was opened above the entrance of the saphenous and a soft whitish clot was found floating in the blood stream. When this was sucked out bleeding occurred freely from above and the vein was doubly ligated and the division completed. Four days later all evidence of swelling in the right leg had disappeared. On December 11, he suffered a small pulmonary embolus. It was assumed to have arisen in the left leg and the common femoral vein on this side was interrupted above the entrance of the saphenous. The assumption was fairly proved to be correct because the left calf became demonstrably swollen and tender during the next two days. From this point on his convalescence was uneventful. The swelling in the legs was never troublesome and by March 20, 1946, when last seen, it had entirely disappeared.

The question of ligating the common iliac vein on the right might arise but another major procedure on this patient was unthinkable. At the same time ligation of the superficial femoral vein on the left might have been sufficient. It has been shown however that there is no residual oedema after ligating either the superficial or common femoral veins.

The next case is one in which there had been bilateral ligations for multiple pulmonary emboli.

PW, male, aged 24. On February 10, 1945, this patient had a bone graft of the right femur for a compound fracture of this bone. The graft was taken from the right tibia, and he was immobilized in a Roger Anderson apparatus. On February 25, he developed

pain in the right lower chest and expectorated blood streaked sputum. Two days later his temperature rose to 102°. No evidence of phlebitis could be found in the legs. He improved till March 2, and then developed pain in the left chest with a rise in temperature. Bilateral venograms were made and still no lesion could be demonstrated in the lower extremities. On March 5, his right foot was seen to be cyanosed, his pulse was rapid and he had a temperature of 102°. On this evidence the right external iliac vein was ligated on the same day under spinal anaesthetic. This vein was chosen to avoid the pins and apparatus in the thigh. During the next two weeks his temperature returned to normal. Again, on March 21, he developed pain in the right chest associated with bloody sputum and a rise in temperature. It was thought that this embolus had arisen in the left leg and it was decided to ligate the common femoral on this side. This was done with the aid of local anaesthesia on April 23, 1945. No further episodes occurred and his further convalescence was progressive. His oedema subsided rapidly and now he has no swelling. His superficial veins show compensatory dilatation.

Not all emboli arise from deep vein phlebitis as will be seen from the account of the next case.

CJ, male, aged 46. In 1938 this patient had injection treatment for varicosities of the right great saphenous system. He was symptom free till August 25, 1945, when he developed a phlebothrombosis of this vein extending up to the groin. He was treated by rest in bed for three weeks and then discharged from hospital. Two days after discharge he experienced a severe pain in the left lower chest and after two more days was brought to Vancouver Military Hospital with a left pulmonary infarction. The right saphenous vein was hard and tender and the overlying skin was red. The day of admission the three femoral veins were exposed under local anaesthesia and found to be free of thrombus. The great saphenous vein was thrombosed to its junction with the femoral where it was tied and divided. It contained soft friable blood clot which was becoming organized in some areas.

The clot in this instance appeared to have extended into the common femoral and iliac veins and then became detached. It is not unreasonable to suppose that this would have occurred again if ligation had not been done.

CONCLUSIONS

Our series of cases is much too small to draw definite conclusions. One can only say that in the eleven cases which we have operated upon for this condition during the past year there have been no deaths from pulmonary embolus and none of these patients have been left with chronically swollen legs. Our chief problem has been to distinguish between those cases whose lesion would remain local and resolve, and those in which the clotting process would extend with resulting widespread deep vein occlusion or pulmonary embolism or both. By and large, the more obscure the symptoms and signs the greater is the danger from embolic phenomena. We feel, too, that in the more

acute and overt lesions, in which the development of emboli is unlikely, a tendency to extend proximally should be checked at once by vein interruption in order to prevent the occurrence of chronically swollen limbs which are far too commonly seen

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RESUME

Environ 207 à 272% des morts sont dues à des embolies pulmonaires, et il semble que la plupart de ces embolies proviennent des veines des membres inférieurs 95% Les éventualités pathogéniques des phlébites et de la formation des caillots sont discutées La ligature veineuse évite l'embolie pulmonaire et arrête l'évolution du caillot Les 10 malades opérés qui sont ici rapportés ont survécu et aucun n'a conservé d'œdème des jambes Il est difficile de prévoir quels cas demeureront localisés et quels se compliqueront d'embolie Dans les lésions aiguës et ouvertes, on peut éviter l'extension proximale du processus phlébite embolique par l'interruption veineuse précoce On prevendra ainsi, et l'embolie et l'œdème chronique des jambes JFAN SAUCIER

THE MANAGEMENT OF EMERGENCIES IN DIABETES MELLITUS

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DIABETIC ACIDOSIS AND COMA

THE major emergency in diabetes is, of course, diabetic coma, and all other emergencies are to be feared lest coma develop as a complication Coma has been described as being of variable degree, on the basis of clinical state and on the ability or inability to arouse the patient Since the condition is primarily related to the degree of acidosis it would perhaps be best to follow Joslin and define diabetic coma as a condition of diabetic acidosis in which the carbon dioxide combining power of the blood plasma is twenty volumes per cent or less Lesser degrees of acidosis would then be referred to as diabetic acidosis

and such terms as pre coma would be abolished

Before considering the treatment of coma let us consider briefly the pathological physiology of this condition Diabetic coma is the end result of uncontrolled diabetes The normal break down of fatty acids by oxidation at the beta carbon atom continues to the production of butyric acid, or the four carbon atom stage A portion of the butyric acid formed is converted to aceto-acetic acid and beta-hydroxy butyric acid, both of which again may yield acetone These substances known as ketone bodies being highly acid combine with the base of the plasma, thus reducing the available base as measured by the carbon dioxide combining power

It was believed until recently that the normal oxidation of fatty acids was arrested at the butyric acid stage, and that further oxidation required the coincident oxidation of an equivalent amount of carbohydrate This led to the idea of the ketogenic-anti ketogenic ratio, and it was said that fats burn in the fire of carbohydrate Minsky¹ has shown that glucose has no influence on the oxidation of ketone bodies, but that a low liver glycogen content as found in diabetic acidosis permits an increase in fatty acid metabolism with the result and production of ketone bodies in the liver and their discharge into the blood stream at a greater rate than can be utilized by the muscles Insulin prevents this overproduction of ketone bodies by restoring the glycogen content of the liver A high carbohydrate intake will produce a rise in blood sugar which is often associated with an inhibition of ketone production, but it would be unsafe to use glucose alone without insulin in treating a case of diabetic coma²

The keto acids combine with base from the plasma and are excreted by the kidney, thus reducing the plasma base Chloride is also lost from the plasma by several routes, namely, as hydrochloric acid by vomiting which is commonly associated with acidosis, as chloride in the urine due both to marked diuresis (produced by ketone bodies) and to replacement of chloride ion by oxybutyric anion and subsequent excretion of chloride as ammonium chloride The end effects of these developments are (1) a hemo-concentration, (2) a depletion of the fixed base of the plasma, (3) a depletion of plasma chloride, (4) a lowering

* Read at the Seventy seventh Annual Meeting of the Canadian Medical Association, Section of Medicine, Banff, Alberta, June 12, 1946

of the carbon dioxide combining power of the plasma, and (5) a shift of the plasma pH toward the acid side

The rational treatment of diabetic coma, therefore, should be aimed at correcting these disturbances. Before leaving this discussion, one should point out that diabetic coma may occur without ketone bodies being noted in the urine. This is by no means a common finding, but there are quite a number of cases quoted in the literature, and one may come up against it occasionally.³ It has been explained as being due to failure of renal function, or in some cases to the excretion of all the ketone bodies in the form of beta-hydroxy-butyric acid. This latter does not give a direct Gerhardt or Rothera test, but must first be oxidized with hydrogen peroxide. This emphasizes the importance of doing a carbon dioxide combining power determination in all cases of suspected acidosis or coma.

When presented with a case of diabetic coma the physician should immediately ask himself "why did this patient develop coma?" The answer may be fundamental in the treatment. In a new case not previously diagnosed as a diabetic, the cause may be an infection overwhelming a latent diabetes, or the consumption of body tissues, largely fat and protein, in a patient suddenly abstaining from food on account of an intercurrent infection. Similar factors may be at work in a known diabetic, but here the cause is more often dietary indiscretions or the omission of insulin. Many diabetics do not realize that if they do not eat they still need insulin to cover the metabolism of body tissue. Among the infections to be looked for as a precipitating cause to diabetic coma are otitis media, upper respiratory infections, pneumonia, carbuncle, gastro-intestinal infections, acute appendicitis, and many infectious diseases of childhood.

It is imperative that a complete physical examination be done early in the management of a case of coma, since the treatment of the precipitating infection may be the key to the whole prognosis. However, it must also be remembered that diabetic acidosis alone may produce fever, leucocytosis, severe chest or abdominal pain associated with widespread tenderness and even spasm, and therefore surgical operation should not be done in a diabetic until adequate insulin therapy has been given

a chance for three or four hours. In this way unnecessary and dangerous operations may be avoided.

AN OUTLINE FOR THE TREATMENT OF DIABETIC COMA

The proper management of a case of coma demands constant supervision, frequent laboratory tests, and therapeutic procedures requiring facilities for intravenous infusion. It should therefore be mandatory that the patient be admitted to hospital. If the diagnosis is certain when seen in the home a preliminary injection of twenty to forty units of insulin should be given at once the dose depending on the clinical condition. The hospital should then be notified of the expected patient, and the house staff make immediate preparation for his admission. Such preparation should include a warm bed, with hot water bottles, insulin and stimulants, stomach and rectal tubes, saline and glucose solutions, a sterile catheter set, and notification of the laboratory technician.

On admission to hospital the patient should be immediately put to bed—in a private room if possible. Blood sample should then be taken for sugar, chloride, urea (or non-protein nitrogen), carbon dioxide combining power and blood grouping for possible later transfusion, and a urine sample should be taken for sugar and ketones.

As soon as the diagnosis is established, 50 to 100 units of protamine zinc insulin and from 25 to 50 units of unmodified insulin should be given dosage depending on laboratory findings. Some of the unmodified insulin may be put in an intravenous solution but this will not usually be necessary except in cases with circulatory collapse. An intravenous infusion should now be started. Physiological saline for the first part is all that is needed since the blood sugar will usually be high. The patient is in need of both fluid and sodium chloride. One thousand to fifteen hundred c.c. should be given at the rate of 15 to 20 c.c. per minute. Faster than this may produce cardiac embarrassment. If the patient has signs of hyperthyroidism 1 c.c. of Lugol's solution should be added to the intravenous.

The patient should be given a cleansing enema and a gastric lavage unless in *extremis*. Usually the bowel and stomach are distended

Washing these out also provides another route for the administration of fluid. The stomach should be washed out with 500 cc of 5% sodium bicarbonate. Some authorities advise leaving 100 cc of this solution in the stomach, and administering a further 500 cc intravenously if the carbon dioxide combining power is below twenty volumes per cent.⁴ Usually this is not necessary, but in cases of profound acidosis it will speed recovery.

In children circulatory stimulants are not usually necessary, and in adults with signs of circulatory failure their effect is transient. However, they should be available for emergency use. Adrenalin may be given for extreme collapse. Ephedrine will produce a more lasting effect. Blood pressure should be recorded hourly, and in cases showing a progressive fall, or if systolic pressure drops below 80 mm of mercury, one may use up to 60 cc of 10% sodium chloride given slowly. Arrangements should then be made for blood transfusion. Transfusion will sometimes turn the tide in cases not responding to usual routine. The use of hypertonic saline just mentioned will also very often produce dramatic results in cases of kidney failure with anuria not responding to physiological saline and glucose. Each urine sample should be collected separately for analysis, and if the patient has not voided in three hours he should be catheterized.

Subsequent treatment depends on laboratory findings at three hour intervals until the patient has regained consciousness. Unmodified insulin should be given as follows: 20 units for 4% sugar or more, 15 units for 3%, 10 units for 1%. After the patient has regained consciousness and blood determinations are approaching normal, time intervals for treatment may be lengthened to six hours. The patient should receive at least 60 cc of fluid per kilogram of body weight in the first 24 hours. Five per cent glucose in saline will be useful after the first three hours in preventing overtreatment with insulin.

As soon as the patient is conscious and can take fluid by mouth one may give orange juice or 10% glucose in doses of four ounces every three hours. At this point certain complications should be kept in mind. Hypoglycæmia may be avoided by frequent blood sugar determinations and by giving carbohydrate early. Frequent laboratory tests are needed to pre-

vent return to coma after temporary recovery. This is one of the most important reasons for having the patient in hospital. Circulatory collapse and anuria should be watched for and treated immediately they appear. Ephedrine, eoramine, caffeine, and transfusion of whole blood are useful, and 10% sodium chloride may be needed for anuria.

After twenty-four hours, and after the patient's dehydration and acidosis have been taken care of, return to diet should be gradual. Fruit juice, skim milk and oatmeal gruel are usually tolerated well. For the first few days it is well to give feedings at six hour intervals with the 24-hour carbohydrate divided into four equal parts. In this way the patient has a constant steady supply of carbohydrate and is not subject to long fasting period from evening meal to breakfast. After the diet has been built up to basal metabolic requirements it can then readily be redistributed in three ordinary meals, controlled with a basic am injection of protamine zinc insulin supplemented with a regular insulin doses. Eventually the total daily insulin can then, in most cases, be gradually transferred to an a breakfast dose.

MANAGEMENT OF INFECTIONS IN GENERAL

The diabetic out of control is very vulnerable to infection, but the controlled diabetic is very little more so than the normal individual. The nutritional state of the patient is a prime factor in his resistance to infection. The uncontrolled diabetic shows poor agglutinin production in response to infection. Local infections even of a trivial nature should receive prompt surgical treatment.

If the infection is general one must be on the alert for acidosis. Infection in the diabetic usually leads to increase in the severity of the diabetes. This may require up to four times the regular dose of insulin, and is probably due to a variety of factors, such as destruction of insulin by trypsin of pus cells, increased metabolism of fever, depletion of liver glycogen by bacterial toxins, and development of insulin insensitivity. The latter factor may be related to sodium and potassium metabolism, since it has been shown by Wilbur and Wilder that insulin sensitivity may be increased by a large intake of sodium and restriction of potassium.

Acidosis can be prevented in many infections by frequent testing of the urine and the prompt

use of additional unmodified insulin. The patient should be taught to take enough insulin to keep his fasting urine sugar-free, even though he reduces his food intake on account of anorexia. Carbohydrate in the form of fruit juice and oatmeal gruel is usually well tolerated. In modern times the advent of the sulfonamides, and more recently of penicillin, has been extremely valuable to the diabetic in preventing coma from infections. With control of infection one must be careful to reduce insulin dosage again according to need and avoid hypoglycemia.

CARBUNCLE

All diabetics should be warned of pyogenic skin infections, and should be impressed with the necessity for cleanliness. They should be instructed not to pick or squeeze any skin lesion, no matter how trivial it may appear to be. Penicillin has revolutionized the treatment of carbuncle. Rest in bed with rigid diabetic control, and the use of gauze dressing with boric acid and 50% alcohol to prevent local spread may be sufficient when combined with intramuscular penicillin. Many early lesions will resolve without proceeding to localized pus formation under this routine. When pus accumulates it should be released, but wide surgical incisions are to be avoided.

CARDIOVASCULAR DISEASE

The diabetic is particularly prone to the development of arteriosclerosis. However, there does not seem to be any direct correlation between the severity of the diabetes and the degree of arteriosclerosis. In the treatment of coronary disease one should realize that the diabetic heart stores glycogen only if the blood sugar is maintained above normal. It is therefore important that such a patient should not be subject to periods of hypoglycemia, and it is perhaps safer to allow him to carry a blood sugar a little higher than one otherwise would. If he is controlling himself according to urine tests he had better regulate his insulin to show a faint trace of sugar in the fasting specimen. In some cases of coronary thrombosis there is a definite decrease in sensitivity to insulin, and the dosage will have to be increased accordingly.

In the treatment of peripheral vascular disease with impending gangrene in the diabetic

one can do a great deal with bed rest, alcohol swabs, and a dry heat cradle. If the patient will persist in this treatment and maintain rigid control of diabetes many an amputation can be avoided, or at least postponed for some considerable time. Cellulitis and perforating ulcers may be adequately handled by medical treatment, bed rest, elevation, and penicillin intramuscularly.

When gangrene appears it should be given a short trial on medical treatment. Dry dressings are advocated for dry gangrene and alcohol gauze for infected gangrene. If, after twenty-four hours, the gangrene is subsiding, medical treatment may be continued, if, however, it is spreading rapidly, or has reached the ankle, amputation is recommended. When amputation is done it should be done high in the first instance, or it will have to be repeated. Toes should never be amputated.

PULMONARY TUBERCULOSIS

Pulmonary tuberculosis is much more common in the diabetic than in the non-diabetic, and this is even more marked in those who have a history of coma. All diabetics should have a chest x-ray as part of their routine examination on diagnosis, and an annual re-check is advised. In uncontrolled diabetes, tuberculosis tends to spread rapidly. With a rapidly developing pulmonary lesion increase in sensitivity to insulin may be very marked. This is especially true if there has been a rapid loss of weight. One is then beset with frequent hypoglycemic reactions even on low insulin dosage.

The coincidence of these two diseases provides a problem in dietetics, since in the one case overfeeding is the rule, whereas in the other it is to be avoided. The total caloric intake should be adjusted to restore the normal average weight. A diet low in protein and relatively high in fat and carbohydrate is probably the best for the patient with pulmonary tuberculosis. High protein by its specific dynamic action speeds metabolism. The highest death rates in tuberculosis are those with low lipid content.⁴ Our experience with diets very high in carbohydrate and very low in fat has not been particularly satisfactory. Wide fluctuations in blood sugar levels have occurred. We have found that a more moderate mixture of fat and carbohydrate leads to smoother control with insulin. Control and arrest of pulmonary tuberculosis is quite possible in a co-operative patient and indeed

these patients are as a rule among the most co-operative

HYPERTHYROIDISM

The possibility of hyperthyroidism in a case of diabetic coma should always be considered. If signs are present, iodine is advised as part of the coma treatment regimen. Conversely, one should be wary of making a false diagnosis of diabetes in a hyperthyroid with glycosuria, an elevated fasting blood sugar, and an abnormal glucose tolerance curve. Hyperthyroidism interferes with the storage of liver glycogen—antagonistically to insulin action. The increased metabolism it produces also calls for increased insulin requirement. With a liver low in glycogen and an increased insulin requirement severe insulin reactions are frequently encountered. Hyperthyroidism in a diabetic should be treated early by thyroidectomy, since its persistence will lead to an increase in severity of the diabetes.

PREGNANCY IN THE DIABETIC

It is unwise to disregard the finding of glycosuria during pregnancy. Even though transient it may be evidence of a latent diabetes. A glucose tolerance test done three months post partum will settle the issue. Pregnant diabetic women are subject to fluctuation in carbohydrate tolerance, and great care must be taken in their control.

Total metabolism is increased, glycogen stores are lowered, and acidosis is always to be feared. The incidence of eclampsia in pregnant diabetics is 5% as compared with a rate of 0.3% in the non-diabetic.⁵ Although the mortality rate of the mother has steadily decreased since the advent of insulin, and the use of higher carbohydrate diets, the fetal mortality has remained high until very recently. This recent improvement has been due chiefly to control of hormone balance by substitution therapy. Monthly determinations of prolactin and oestrin in the urine will indicate the danger of toxæmia. Toxæmia is likely in a case with rising prolactin, and with a high prolactin and a low oestrin in the later months toxæmia is almost certain. Hormone imbalance has been found in 60 to 70% of diabetic pregnancies.⁶

The ideal routine is to do prolactin levels in all cases, but this is not always practical owing to lack of laboratory facilities. In the absence of such control routine hormone therapy in all cases is advocated by White.⁶ The high cost of

progesterone often makes this impossible. However, these procedures will reduce fetal mortality in the diabetic to normal levels.

The pregnant diabetic should receive a high intake of thiamine on account of her increased metabolism. She should be followed by daily urine tests for sugar and ketone, and it is better to allow a trace of sugar since hypoglycæmia is bad for the fetus. In the later months hypoglycæmia from fetal insulin must be considered. Another point which one should watch for is the development of a lowered renal threshold for sugar. The mother may be excreting sugar with a low blood sugar. Periodic fasting blood sugar determinations are therefore advocated.

The most difficult patients to control are those whose diabetes is of long standing or had its onset in childhood. This group provides the greatest risk, both fetal and maternal. With the possible exception of the very mild diabetic of recent onset, the leading authorities at present favour Cæsarean section at the thirty-sixth to thirty-seventh week as the best method of delivery. As a rule the diabetic mother should not be allowed more than two children, the second Cæsarean being accompanied by sterilization.

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Is it necessary and desirable, that the State should become the physical owner of every hospital? A hospital is something more than a place in which expert work is done. It is a living entity, a centre of local loyalty and reflection. The essence of a good hospital service is that there should be local interest in it and responsibility for it. Will that continue if the State becomes the physical owner of the hospital? That is an issue for us to ponder. Will the conversion of every institution into a State establishment improve the quality of the hospital service? Is there sufficient evidence of the wisdom, humanity, and capacity of the State to justify the abolition of the local character and ownership of hospitals? Is this grumble one which in the public interest we are justified in making? The endowments of voluntary hospitals other than teaching hospitals will pass, via the Minister, to the region. Local hospitals, other than the teaching hospitals, will not be permitted to accept or hold endowments. It will be no longer more blessed to give than to receive—Dr Chris Hill, *Brit M J*, May 11, 1946.

THE SURGEON-ANÆSTHETIST RELATIONSHIP

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THIS being the first meeting sponsored by the Manitoba Division of the Canadian Anæsthetists' Society, may I be permitted to digress from my subject to pay tribute to two members of our profession who limited themselves to this field and who were held in the highest esteem by their professional contemporaries. I would also like to refer to some of the more recent activities which led to the formation of the local Anæsthetists' organization.

Dr William Webster was the pioneer anæsthetist of Western Canada and was the first to specialize and limit his work to this field. He conformed to the modern conception of an anæsthetist, seeking the effects of his drugs in the physiological laboratory of the late Professor Swale Vincent. According to one of his biographers, Dr Aikenhead, "his opinion was in harmony with the modern viewpoint that doctors would be chosen as anæsthetists by virtue of their efficiency in the correlation of the scientific and practical aspects of anæsthesia." Dr Webster was appointed lecturer in 1905 by the Manitoba Medical College and Honorary Anæsthetist to the Winnipeg General Hospital in that year. From 1907 on, he confined his work to this specialty. In that year, he gave a spinal anæsthetic, probably the first in Western Canada, to a patient with acute intestinal obstruction. In 1914, Dr Webster joined the armed services and became lieutenant-colonel of the 4th Canadian Field Ambulance. By all his brother officers and his men, he was considered a fearless soldier. His tragic death came suddenly in 1934 at the age of 69.

Likewise, I would pay tribute to the memory of the late Dr Edith Ross, specialist in anæsthesia, who carried on for Dr Webster as anæsthetist at the Winnipeg General Hospital in his absence during the first World War. She possessed a charming personality. She was

efficient, careful and wise in the performance of her work a favourite with patients and surgeons alike. After leaving the Winnipeg General Hospital, she became anæsthetist to the St Boniface Hospital where she continued until her health failed.

According to the Divisional Secretary, Dr Donald Huggins, the first study group among anæsthetists in Winnipeg was formed during the winter of 1941-1942. Regular monthly meetings were held at which original articles were presented and papers were read and discussed and newer anæsthetic agents and methods of induction studied. In October, 1945, the Winnipeg Anæsthetists' Society met to organize the Manitoba Division of the Canadian Society and a request that the Winnipeg group constitute a section of the Winnipeg Medical Society was granted in January, 1946. There are now sixteen members of this Society in the Manitoba Division. The Winnipeg Medical Society has good reason to be proud of the new section. With the enthusiasm that has marked its beginning, and with the sustained interest of the members, I know that this specialty will develop and attain the status which it deserves.

In the past, the surgeon had adopted the attitude that he alone assumed full responsibility for the patient and that every phase of the operative procedure, including the administration of the anæsthetic, must be under his direction. Despite the fact that this state of affairs constituted a heavy burden to himself, in addition to the actual performance of the operation, one cannot deny that many surgeons revelled in this rôle of exalted authority and would have relinquished it only with considerable reluctance. Under this arrangement, the anæsthetist was little more than a technician whose few duties included keeping the patient asleep and relaxed with a profound anæsthetic agent such as ether or chloroform. However, if the patient failed to survive the operation, the anæsthetist was expected to assume complete responsibility for the unexpected fatality!

After serious contemplation with an open and sympathetic mind, I can understand that this state of affairs was intolerable and could not continue indefinitely. Now one can appreciate that this organizing of anæsthetists is the result of the release of pent-up emotions, and one realizes that despite their customary calm, pleasant and reasonable exterior they have

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harboured deep and abiding resentment which has finally erupted after simmering for many years. The Canadian Anæsthetists' Society, incorporated in 1943, symbolizes a portion of this renaissance of anæsthesiology. However, no one will welcome the formation of this Society and the carrying out of its objectives more than the surgeons.

Already, mention has been made of the extraordinary manner in which the surgeon once shouldered the complete responsibility involved in every case. But now a change in the character of the anæsthetist's functions has occurred and, with this new development, the anæsthetist assumes heightened responsibilities, which elevate him in medical society. He is no longer a technician but a specialist and a consultant and obviously he must be a medical graduate.

This change in status has resulted in an encroachment by the anæsthetist on the field of influence of the surgeon but this new deal has not burst suddenly upon us. However, I became definitely aware of the change by a recent experience at the hands of one of your colleagues, none other than your President, Dr Aikenhead. Towards the end of a hard morning's work, when already weary because of some time-consuming cases and having helped tidy up the room from the previous operation, I found myself trying to restrain the patient during a difficult induction. Dr Aikenhead entered the theatre and, without any ceremony, suggested I prepare myself for the operation and leave the handling of the patient to himself and the others in the room. A few minutes later, when all was under control, he reproached me by saying that I reminded him of a certain Bishop who took his responsibilities most seriously. Every night he was accustomed to pray at great length for the spiritual and physical welfare of each and every member of his flock. The loss of sleep was such that his health was impaired but nothing could dissuade him from what he considered was his duty. Finally, in the small hours of the night, he heard a voice beside him saying, "Bishop, I am God, go to sleep. Leave your worries to me." "So", Dr Aikenhead repeated, "you remind me of the Bishop." To which I replied, "I may be the Bishop, but who — do you think you are?"

Medicine continues to be a science that is forever growing and progressing and its advances are notable. Gains in one field beget or influence

successes in another. Thus the brilliant researches of Pasteur demonstrated the germ theory of putrefaction to Lister and his achievements in asepsis revolutionized surgery. As a result, disease has been attacked with safety to the patient in one body cavity after another as improvements in technique have been attained. So far as surgery is concerned, its problem today as it has been in the past and as it will continue to be, is the relief of the patient as quickly and efficiently as possible. This subject involves the consideration of many phases of medicine, viz, diagnosis, preparation for surgery, the operation itself, and finally, the no less important after care. The evolution of modern medicine, as it is practised in hospitals and medical centres of any size, has produced a division of labour or effort among the profession. No longer is it reasonable that an individual should be responsible for all phases of medical care. It is now generally agreed that the trend of specialization has resulted for the most part in benefits to the patient through increased efficiency in his medical attendants.

However, if there is truth in this it is because the specialist, to work efficiently, must have some relationship with others who altogether, represent the whole of which the specialty is a part only. In the field of medicine, there is no better example of such co-operation than in surgery and anæsthesia. The fine advances in the relief of disability and suffering, which have resulted during the years since Lister, cannot be imagined if those unavoidably cruel days of surgery before anæsthesia had not been eliminated by the first administration of ether by Long in 1842 and its popularization by Morton in 1846. So completely has this achievement been accepted that today little thought is given to the advantages resulting from anæsthesia. They have become familiar and are expected. The anæsthetist has assumed a most important rôle in the drama played daily in a thousand operating rooms, yet the importance of his part is not recognized fully except by his professional associates. Little imagination is necessary to appreciate the benefits of unconsciousness at the time of surgery. It is not only a boon to the patient, but the relaxation is an inestimable technical aid, in the exposure of the operative field, that only the surgeon can evaluate.

It is remarkable, inasmuch as many patients fear the anaesthetic more than the operation, that so little emphasis is placed on the capabilities of the anaesthetist in preliminary discussion with the patient regarding his coming ordeal. Frequently, the type of anaesthetic is mentioned and occasionally the patient may express some choice in this matter but only rarely is he concerned about the qualifications of the individual who will administer it. Too often we fail to impress the patient *that the anaesthetist is much more important than the agent*. It must be confessed also that we fail too often to give our colleagues, the anaesthetists, the full measure of credit to which they are entitled.

In a comparatively brief time a variety of anaesthetic agents, apart from ether, have made their appearance and many refinements in their use have resulted. It is no longer possible to practice anaesthesia without familiarity and experience in the administration of these new methods. This has led, of necessity, to specialization in anaesthesiology, since the principle in anaesthesia is now to make the anaesthetic fit the patient and his problem instead of the reverse. As a result of this progress, the field has become an intensely interesting and promising one, naturally providing many attractions which more and more of the members of the medical profession are accepting. The fully trained and capable anaesthetist is an increasingly welcome member of the surgical team. He no longer resembles the anaesthetist of an earlier day whose work was limited to the production of a state of unconsciousness in the patient and whose manner of doing this was of necessity limited by the means available at that time.

The modern conception of surgery is that it is performed by a group or a team. Each member of such a team has his own tasks to perform in order that the procedure in hand may reach a successful conclusion. The ability to perform such tasks depends upon training, experience and personal ability. Some of the team work demands less of these qualifications than other parts. Thus, excellent operating-room nurses may be developed in a year's continuous work. On the other hand a highly qualified surgeon must have first been prepared to spend many years as an assistant to his surgical preceptor before his technical skill has reached a high level while that indeterminate

quality known as judgment is obtained still more slowly. In more recent years, the emergence of the anaesthetist to assume his rightful position has provided the surgical team with a strong and most welcome addition. His training is specialized but it is a training based on broad principles, concerned not only with methods of anaesthesia but with other subjects. His knowledge of his drugs depends upon post-graduate training during which time he has the opportunity of studying their effects in animal experimentation as well as in clinical administration. His knowledge, of necessity, must include a most thorough grasp of physiology of the cardiac and respiratory systems and the anatomy of certain body areas where regional anaesthesia is commonly employed. During the operation, he is more often the "silent partner" employed in a number of tasks with efficiency and without turmoil, thus freeing the surgeon from anxieties responsibility for which may impair his work and judgment.

Let us enumerate those measures which are now applied to determine the status of the seriously ill patient who requires surgery. Complete investigation results not only in more accurate diagnosis but permits evaluation of the patient's cardiac, renal and hepatic reserve. This may be assessed by the combination of clinical observations and laboratory tests with greater accuracy than formerly. In the same manner, degrees of anaemia, hypoproteinaemia, avitaminosis, dehydration, and mineral deficiency, which may follow prolonged vomiting or starvation as the result of disease, may be recognized and corrected prior to operation. Metabolic and endocrine imbalance associated with hyperthyroidism and diabetes are better understood and more effectively controlled than prior to twenty-five years ago. We depend upon the medical consultant to recognize and correct these and other matters. This involves careful preoperative preparation which may be considered as the second stage in the planned management of the surgical case. It means that a patient requiring a major surgical procedure is no longer operated upon the day after his admission. Sufficient time is permitted to allow for a substantial improvement in his general condition as far as this is possible before the actual attack upon the diseased organ is undertaken.

Towards the end of this period, the anæsthetist enters the picture. Armed with the information now available, he can determine the type and amount of preoperative sedation. He is able, now, to advise what most suitable anæsthetic may be employed. It is at this very point that a salutary change has occurred in the relationship of the anæsthetist to the patient. He meets and talks to the patient on the ward, reviews the history and the results of special tests, and shares some responsibility for the preoperative medication. The result, as far as the patient is concerned, of this careful preparation and consultation with internist and anæsthetist, is his arrival in the operating-room better fitted psychologically and physically for the ordeal he faces. Once in the operating-room, the team-work already started on the ward continues, only the ward nurse is now replaced by the scrub nurse. From this point onwards, the closest collaboration must prevail between the surgeon and anæsthetist. *Ample time must be allowed for proper and unhurried induction. Here, time may often be saved by waiting.* In abdominal surgery, certainly, muscular relaxation together with an adequate incision are the two factors which contribute so much to the reduction of the hazards of surgery and make for precision in anatomical dissection.

In a critically ill patient, it is often well to divide the operation into stages, a matter which may have to be decided by consultation between the anæsthetist and surgeon. Here the rule that *it is wiser to do less twice than too much once* should be observed. It is, of course, during the operation that the anæsthetist is making his greatest contribution. Proper oxygenation as well as relaxation is of paramount importance. The damage produced by a state of hypoxia cannot be overstressed, as it effects not only the brain but other cells in the body. Intratracheal intubation is frequently to be considered a life-saving procedure, as in difficult thyroid cases, by permitting free and unhindered oxygenation. Further than this, the anæsthetist's responsibility includes the replacement of body fluids, and he must be an expert in the administration of intravenous fluids.

Today, the anæsthetist visits his patients for at least forty-eight hours after operation, playing his part in the early detection and prevention of pulmonary and other complications. In

the further care of the seriously ill patient, in the early postoperative period, the internist again shares the responsibility of the case. In this arrangement, one sees the anæsthetist as a very active collaborator not only during the operative period but over a period of two to four days.

At this juncture it might be well to review briefly our personal experiences of the past few years and indicate reasons for preferring certain methods of anæsthesia.

Ten years ago, spinal anæsthesia was used almost exclusively in difficult abdominal cases. Today, we rarely use it and only under very special circumstances. It has especial advantage, I believe, in cases of suppurative appendicitis, where the presence of a quiet, flaccid abdomen and contracted intestine adds greatly to the safety of the operation. Its use has been largely discontinued in hernia repair because of bladder dysfunction occurring in some six cases, two of my own and four others, hitherto symptomless, and in which recovery of function was long delayed. Enthusiasm for this method has also been reduced because of the patients, though relatively few, who complain of back pain and weakness, headache and even leg pains afterwards. Considering the large number of cases that we have operated upon under spinal anæsthesia without untoward result and with the improvements in technique that are now used, spinal anæsthetic is still a most useful method to produce anæsthesia and relaxation.

For cases of major abdominal surgery, which are often time consuming—resection of stomach and colon, common duet exploration, and the like—we now prefer cyclopropane, administered through an intra-tracheal tube, supplemented with intravenous curare. More than 150 cases have been operated upon using this combination, without a death. We are convinced that a wide margin of safety exists when this method is employed by one who is experienced with it. Patients leave the operating-room in much better condition, possessing a warm dry skin in contrast to the moist cold skin following a lengthy spinal, with a minimum of shock and reduction of postoperative complications.

The record for thyroid surgery in Winnipeg has been consistently good for many years and continues to improve. That we are able to report a series of 402 consecutive cases—many of which were extremely toxic and some bed

idden because of cardiac damage—without a death is evidence of this fact. In this series of cases of gothic surgery there has been no death since 1938. No improvement in surgical technique is responsible for this situation. Full credit for this satisfactory result must be given for the excellence of the preoperative medical management and the care and skill exercised in the administration of the anæsthetic.

As members of the medical profession, physicians, anæsthetists or surgeons, we must all be interested in the results of surgery, including its morbidity and its mortality. There can be no doubt that the end results of surgery are better than they used to be. Statistics available from all centres indicate this. Surgeons cannot claim that such important changes have affected their technique as to be alone responsible. No one will deny that the surgeons of twenty years ago were masters of operative technique nor would they yield in any way to their present day successors. Other measures, apart from actual surgery, such as closer collaboration with the internist in the management of major surgical problems, more thorough preoperative preparation, and safer anæsthesia, must be credited with much of what has been accomplished.

It is, furthermore, obvious that where mutual respect and harmony exist in the operating theatre between the surgeon and his capable ally, the anæsthetist, much can still be achieved in the elimination of what has hitherto been considered the final and irreducible degree of failure which mars surgical records.

A RECORD HIGH SOURCE OF ASCORBIC ACID—Guava at 300 mgm ascorbic acid per 100 gm, the fruit of the emblic tree at 800 mgm, and rose hips at 1,200 to 1,700 mgm are extremely rich natural sources of ascorbic acid. It is now reported (C. F. Asenjo and A. R. F. de Guzmán, *Science* 103: 219, 1946) that the West Indian cherry may contain as much as 3,300 mgm of ascorbic acid per 100 gm. This cherry, weighing about 5 gm, is reported as the fruit of the tree commonly called "acerola" in Spanish, and is native to tropical and subtropical America. The variation in ascorbic acid appears to depend principally on the ripeness of the fruit. The green unripe berries contain from 2,500 to 3,300, medium ripe 2,500 to 3,000 and the ripe berries 1,000 to 2,700 mgm %. These workers have further more isolated and identified pure l-ascorbic acid from the juice of these cherries.

Apart from the strictly nutritional aspects of the exceptionally rich natural sources of ascorbic acid, is the vexing question of the possible physiologic basis for such a high concentration. Could a study of the metabolism of rose hips and the West Indian cherry offer any particular advantages in the study of the function of ascorbic acid?—*Nutrition Reviews*

IMMUNIZATION IN CHILDREN

By J H B Grant, M D

Vancouver, B C

OUR greatest endeavour should be expended in an attempt to actively immunize as many people as possible, and especially children, as it is in the early years of life that most infectious diseases are contracted.

In Canada most of the necessary products used in both active and passive immunization procedures are supplied free by various governmental agencies and are readily obtainable and very reliable.

Immunization will be considered in reference to the following diseases. That a very definite need still exists can be seen by examining Table I.

TABLE I

CASES REPORTED BY PROVINCIAL HEALTH DEPARTMENTS TO THE DOMINION BUREAU OF STATISTICS, DURING THE YEARS, 1926—1944

Year	Small-pox	Diphtheria	Measles	Scarlet fever	Whooping cough
1926	1,536	7,175	39,429	14,238	6,968
1927	2,844	8,501	28,150	15,462	6,691
1928	3,328	8,781	27,733	14,585	6,649
1929	1,942	9,010	42,132	15,887	10,536
1930	1,293	8,036	21,606	17,018	11,747
1931	866	5,914	25,664	12,783	9,174
1932	347	3,912	53,608	9,659	12,058
1933	100	2,377	13,571	10,009	14,622
1934	17	2,267	29,115	16,234	19,484
1935	34	1,999	83,127	17,677	17,991
1936	62	2,031	55,724	21,226	16,256
1937	58	2,945	57,408	16,747	17,396
1940	11	2,330	45,829	13,700	19,563
1942	6	2,955	26,258	20,648	18,284
1944	0	3,223	55,317	20,945	12,384

SMALLPOX

In Vancouver the subject of smallpox vaccination is a very timely one. For many years up to 1932 we had had frequent visitations of a mild form of smallpox with very little mortality. In 1924 and 1925 there were about 800 cases with only 1 death. Then in 1932 we encountered a much more severe form with 17 deaths in a total of 56 cases. During this epidemic about 80,000 persons were vaccinated in the city.

Since 1932 we have had only 5 to 10 cases, none at all since 1939. But in March 1946 an outbreak of a very severe form occurred in

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Seattle, 150 miles away. The mortality in the first 30 or 40 cases was about 25%. The whole west coast became alarmed and people in Vancouver and other coast cities rushed to be vaccinated. The border between western Canada and western U.S.A. was closed to those who had not been vaccinated within a year and not a case appeared in Vancouver.

Between 100,000 and 150,000 persons were vaccinated in Greater Vancouver. We feel that our freedom from smallpox in 1946 was in a large measure due to the mass vaccination of our citizens acting on the prompt request of our Public Health Department.

Vaccination is now a familiar procedure, but perhaps it may be worth repeating that it should be performed before the child's 1st birthday, preferably from the 8th to 10th month of life. Immunity to smallpox is gradually dissipated and is completely lost in about 50% of children at the end of 5 years, so that vaccination should be repeated every 5 or 7 years, and in one and all in the presence of an epidemic of smallpox.

Vaccination is effective also if performed successfully 2 or 3 days after exposure to the disease.

DIPHTHERIA

This disease came next among our infectious diseases that can be controlled by immunization. The results are not 100% but with

adequate doses of toxoid the great majority of children will obtain and hold immunity, also it has been found that should the disease develop in children so immunized, it will be much less severe than if no immunization had been attempted.

Two standard materials are offered for active immunization against diphtheria:

1. Alum precipitated toxoid—given in 2 or 3 doses, $\frac{1}{2}$ cc, 1 cc, and 1 cc at 2 or 3 weeks' interval. This material will give a faster and a more lasting immunity but unfortunately the alum may produce a sterile abscess, and for this reason we adhere to the second potent agent.

2. Ramon's diphtheria toxoid given in 3 doses, 1st dose, $\frac{1}{2}$ cc, 2nd dose, $\frac{1}{2}$ to 1 cc, 3rd dose, 1 cc, at 3 week's interval. There is practically no reaction to this dosage in young children. All children should be immunized early in life, preferably in the first year, with a booster dose of 1/10 cc toxoid when child starts school, and every 5 years thereafter.

Routine immunization against diphtheria or reinforcement should be performed after 10 years of age, only after either a sensitivity or a Schick test, and doses modified as necessity requires.

The Schick test is a great help in checking the immunity level against diphtheria in the population at large. If it is positive there is not sufficient immunity present and the patient

TABLE II
NUMBER OF DEATHS FROM CERTAIN DISEASES FOR CHILDREN UNDER 1 YEAR AND UNDER 15 YEARS, IN CANADA (I), 1926 TO 1944

Year	Measles		Scarlet fever		Whooping cough		Diphtheria		Typhoid fever	
	Under 1 year	Under 15 years	Under 1 year	Under 15 years	Under 1 year	Under 15 years	Under 1 year	Under 15 years	Under 1 year	Under 15 years
1926	263	854	25	313	773	1,232	47	850	1	99
1927	187	595	35	366	640	1,028	18	967	6	243
1928	89	316	25	285	469	721	48	859	6	107
1929	172	568	20	358	454	751	43	913	3	81
1930	212	510	30	330	686	961	49	680	1	92
1931	56	156	14	217	502	745	54	607	1	71
1932	119	310	13	172	339	550	27	366	1	75
1933	60	165	12	134	388	548	19	222	—	45
1934	73	183	7	202	605	869	11	217	3	55
1935	181	470	15	206	599	888	11	249	2	44
1936	115	344	11	194	392	589	11	228	—	45
1937	268	731	11	233	485	760	21	345	2	46
1938	91	236	13	171	334	495	20	405	—	34
1939	69	190	14	142	382	540	31	307	1	40
1940	68	151	6	96	472	625	12	196	1	36
1941	125	272	6	84	325	436	23	212	—	34
1942	52	114	10	94	413	557	26	233	1	18
1943	71	171	7	66	313	416	26	254	—	17
1944	95	224	8	88	239	336	28	273	—	16

Exclusive of Yukon and the Northwest Territories

should be immunized especially if exposure to the disease is at all likely. On the other hand if the test is negative there must be a definite degree of immunity, but this may not be enough to prevent the disease occurring in the event of exposure to a heavy dose of a virulent strain of the diphtheria organism. This immunity can be enhanced by the booster doses of toxoid.

That a very definite improvement has occurred in the mortality figures for diphtheria among Canadian children in recent years is shown in Table II.

The results shown in Table III for the City of Vancouver show a striking benefit from the use of diphtheria toxoid since large scale methods came into use about 1931.

TABLE III
CITY OF VANCOUVER, B. C.

Year	Diphtheria mortality rate per 100,000 population	Number of children immunized
1920	13.82	
1921	1.64	
1922	9.48	
1923	8.82	
1924	10.56	
1925	6.31	
1926	11.69	
1927	5.83	
1928	7.74	
1929	7.89	
1930	2.91	Toxoid commenced
1931	2.02	continued
1932	0.41	"
1933		"
1934	1.23	"
1935	2.05	1,827
1936	1.21	2,360
1937		2,924
1938	0.77	2,865
1939		2,531 Reinforcing
1940		2,725 dose
1941		2,947 496
1942		3,610 652
1943	0.69	3,928 2,124
1944		3,572 2,013
1945		3,770 2,710

The above figures are of immunizations given by the City Health Dept. Staff and do not include procedures by private physicians. Records from 1930 to 1934 are very incomplete but work was carried on in the schools and child health centres quite extensively.

WHOOPING COUGH

Whooping cough now accounts for more deaths, in the first 2 years of life, than all the other infectious diseases combined. It is not uncommon in early infancy. About 75% of all whooping cough deaths occur in the first year of life. See Table IV.

A great deal of work has been done by Sauer, Kendrick, Strain and many others to produce

a vaccine that will effectively immunize against this disease.

TABLE IV
DEATHS IN CANADA—1942

	Disease				
	Typhoid fever	Scarlet fever	Measles	Diphtheria	Whooping cough
Under 1 year	1	10	52	26	413
From 1 year to 5 years	1	30	51	114	134
From 5 years to 15 years	16	54	11	93	7
Total all ages	92	129	131	256	560

Much of the vaccine¹ used in Canada is a suspension of Phase 1 strains of *H. pertussis*, prepared by Sauer's method. Usually injected at 3 weeks' intervals for a total of 6 c.c. fluid containing 90,000 million bacilli. Number of injections depends on age of child and degree of reactions. Reactions are usually a slight elevation of temperature and some tenderness and redness at site of inoculation.

Reinforcing doses of 1 c.c. can be given at end of 1 year and again at end of 2½ years, after completion of regular series. Immunity does not become solidly established until 3 or 4 months after the last injection of the regular series.

Experience over a period of years indicates that from 60 to 80% are protected for at least 5 years. In Sauer's own city of Evanston, Ill., from 1938 to 1945 no child that had been injected in Evanston, is known to have developed whooping cough.

The greatest problem we have today regarding whooping cough immunization is in relation to the very young infant. It is stated that infants under 6 months do not produce sufficient immunity reaction to either diphtheria or whooping cough vaccines to prevent these diseases on exposure. And again, in the case of whooping cough, that any immunity artificially induced in young infants is not enduring or supposing that immunization is started, say at 1 month, the well established lag of 3 or 4 months previously mentioned brings the child to 6 or 7 months of age before immunity is established firmly—by this age 60% of whooping cough deaths have occurred. See Table V.

Sauer¹ states definitely that it has been firmly established that for infants less than 6 months of age only alum-precipitated pertussis vaccine

TABLE V
BREAKDOWN OF DEATHS IN CANADA—1942

	Disease			
	Scarlet fever	Diphtheria	Measles	Whooping cough
Total	10	26	52	413
Under 1 month	1	0	6	27
1 to 2 months	1	5	5	64
2 to 3 months	0	6	5	67
3 to 4 months	1	2	2	45
4 to 5 months	1	1	7	48
4 to 5 months	1	1	7	48
5 to 6 months	0	2	6	26
6 to 7 months	2	0	5	27
7 to 8 months	0	1	2	20
8 to 9 months	0	1	6	26
9 to 10 months	2	7	7	25
10 to 11 months	0	7	7	17
11 to 12 months	1	2	2	19

should be used, with a total dosage of about 45,000 million bacilli and that infants injected so early in life should be re-immunized soon after the 7th month. Di Ranta⁴ in a recent review brings forward the question of immunizing the prospective mother, against whooping cough, in the middle semester of pregnancy.

In our routine immunization procedures at the present time we are using a combination of diphtheria toxoid and pertussis vaccine. The dosage of each material is the same as previously stated with a little difference in technique, viz. For infants over 6 months, three subcutaneous doses, each of 2 cc in each arm at monthly intervals. Under 6 months we divide the primary amount, making 4 subcutaneous doses. Reinforcing doses, 1 cc of combined vaccine subcutaneously at end of 1st years and end of 2nd years after initial course. Age of combined injections should be from 6th month.

The benefit of combined solution is reduction of the number of injections needed in the immunization against these two diseases.

SCARLET FEVER

There is a great deal of argument as to the advisability of attempting to immunize against scarlet fever.

Susceptibility to scarlet fever may be determined by the Dick Test. Dick-positive children can usually be made Dick-negative by the weekly injections of increasing doses of scarlet fever toxin, 5 injections are usually given. Many children show a considerable local and constitutional reaction to these injections and parents must be warned of these possible reac-

tions. Many physicians object to using immunizing material that causes so much discomfort.

Other objections point out that giving the toxin prevents the appearance of the rash in children that are nevertheless suffering from a streptococcus infection evidenced by sore throat and fever. These children so affected, if not quarantined, may spread the disease to other susceptible children.

On the other hand if the rash is merely one evidence of the effect of erythrogenic toxin as applied to the skin and if this toxin circulating through the body damages the kidneys, heart, etc. and if one can, by use of scarlet fever immunization prevent the systemic insult delivered by erythrogenic toxin the patient will have been done a great service.

One is safe in asserting that in institutions with patients and nurses exposed to scarlet fever and in the presence of an epidemic of scarlet fever in a community, immunization may be of great benefit. All Dick positive persons should be immunized in these circumstances. The age preferred for immunization should be after 1 to 2 years.

As seen from Table II, scarlet fever, during the years 1940 to 1945 has been quite prevalent in Canada, but the total number of deaths has been under 100 yearly making a mortality rate from 0.4 to 1.4%. Chemotherapy has effected a marked improvement in the mortality rate.

TYPHOID AND PARATYPHOID FEVER

These diseases can be prevented by the use of TAB vaccine, which has proved its efficacy beyond doubt in all wars since the Japanese war in 1906. The vaccine should be used for individuals usually above 2 years of age living in localities where typhoid fever is endemic, where the water supply is unpurified and the sewage system primitive, for members of typhoid sufferers' families, for institutional personnel, for travellers and for military forces.

Protection may last a long time but in many instances it is lost within a year or two and re-vaccination should be done at least every third year.

TETANUS

Immunity can be produced by tetanus toxoid. After immunization the protective antibody content of the blood serum possessed by the patient decreases as time goes on. Hence in

case of subsequent accident especially in the country, a booster shot of $1\frac{1}{2}$ to 1 c.c. tetanus toxoid should be given. This takes the place of the usual dose of tetanus antitoxin injection in those exposed to the disease.

Age to immunize, 9 months to 3 years re-immunization to be done at time of re-exposure to this disease and this may occur at any age.

Tetanus toxoid is gradually gaining in popularity since it was first introduced by Ramon in 1923. It may be combined with diphtheria toxoid or with TAB vaccine. It is especially of importance to country dwellers where the exposure to tetanus is much more apt to occur.

PASSIVE IMMUNIZATION

1 *Diphtheria*—One thousand units of diphtheria antitoxin may be given to persons of any age that have been exposed to diphtheria. The passive immunity produced may last from 10 days to several weeks but it is not safe to trust to it after two weeks. It is a horse serum product and should be used very carefully and sparingly. It is of special use in country practice. Injections to be given intramuscularly, after testing for sensitivity.

The immunity of contacts who have had former toxoid may be raised by giving a booster dose of toxoid, which is greatly effective in the majority of cases. This may obviate the use of prophylactic antitoxin.

2 *Scarlet Fever*—Three thousand units of scarlet fever antitoxin will usually prevent scarlet fever in those exposed if given within 1 to 3 days after exposure. Same dose at any age. Again, there is the use of a horse serum which will sensitize the patient and again, there is very little reason for injecting this serum for prophylaxis, especially in the face of the relatively mild scarlet fever that has been prevalent this past few years. The passive immunity when produced lasts only about 10 days.

Prevention of scarlet fever after exposure can often be effected by the use of sulfonamide drugs if given in the first day or two after contact.

3 *Tetanus*—Fifteen hundred units tetanus antitoxin subcutaneously as soon after the injury as possible especially where wound is deep and has been contaminated with soil, street dust, manure etc. May be repeated after 7 days in severe or very dirty wound.

If previously immunized give booster dose of tetanus toxoid at time of accident.

4 *Measles*—Convalescent measles serum or placental globulin extract if given in sufficient amount and early will prevent measles in most cases, but since exposure often occurs 3 or 4 days before the rash appears the serum is rarely given in time for complete protection.

If complete protection is desired in very young or sickly children, 10 c.c. of convalescent serum must be injected intramuscularly on or before the 5th day after exposure. The passive immunity thus produced lasts only a few weeks.

In well children above the age of infancy, the objective should be to modify and not to prevent the disease. The above dose should then be given on the 6th day after exposure and not later than the 8th day. Permanent immunity does not invariably follow modified measles.

CONCLUSIONS

1 Excellent results have been obtained from the active immunization against smallpox and typhoid and paratyphoid fever. One hundred per cent immunity can be produced if vaccination and re-vaccination are carefully performed as needed.

2 Diphtheria can be prevented in the vast majority of children by the use of toxoid, reinforced by booster doses every 5 years.

3 Whooping cough vaccine is of definite value but there remains the problem of the very young infant.

4 Scarlet fever immunization has a very definite place but its general acceptance by physicians and parents has not yet come to pass.

5 Tetanus toxoid has not yet come into widespread use but is very effective.

6 For passive immunization (a) Diphtheria and tetanus antitoxin will effectively prevent these diseases if given in time. (b) Scarlet fever antitoxin has been replaced to a great extent by the sulfonamide drugs. (c) Convalescent serum has a definite value in measles.

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CASE REPORTS

BRONCHIAL ADENOMA

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These pulmonary neoplasms are being reported with increasing frequency within the past ten years. Although Jackson, Konzelmann and Norris¹ in 1945 reported three cases of bronchial adenoma which they had had under observation for over twenty years, the correct ante-mortem diagnosis was still rarely made in 1928 when Myerson² reported a case of fibrolipoma of the left main bronchus removed through the bronchoscope. A comprehensive review of the literature has been published by Riordan and Richards.³

The purpose of this paper is to add two more case reports of so-called bronchial adenoma, to discuss the clinical, diagnostic and pathological features of this type of polypoid tumour, and to indicate their therapeutic management.

CASE 1

M M, a white female, aged 36 years, was admitted to the Saint John Tuberculosis Hospital on October 4, 1943. Since 1934 she had had recurring attacks of chills and fever about once a year. In 1939, when she first consulted a physician because of slight cough and sputum which was at times blood streaked, her temperature was 104°. She was told she had a right-sided pleurisy with effusion, remained in bed six weeks and returned to work after four months. In November, 1940, she again became ill with chills, fever, slight cough and sputum, remained in bed two weeks and then returned to work. In February, 1941, February, 1942, and December, 1942, she developed similar symptoms which lasted a few weeks each time. In May, 1943, she again had chills and fever with considerable cough and

sputum which was accompanied by blood spitting for four days. The blood was at first dark, then bright red and was coughed up with very little sputum. On July 7, 1943, a chest roentgenogram was taken for the first time, the patient then being referred to this hospital for investigation. Since July 12, 1943, she has been well with no symptoms except some oppression in the chest when fatigued.

On admission she appeared healthy. Height 64 inches, weight 195 lb, temperature 98.2, pulse 66, blood pressure, systolic 130, diastolic 84. The only abnormal physical finding was present in the right posterior thorax where the percussion note was impaired in the lower third and the breath sounds diminished over the same area.

Laboratory data—Hemoglobin 68%, erythrocytes 3,500,000, leucocytes 9,300. Differential polymorphonuclears 52%, lymphocytes 46%, eosinophils 2%. Sputum, mucopurulent, 1 to 3 dr in 24 hours, negative for tuberculosis. Urine normal. Kahn negative. Sedimentation rate (Westergren) 17.5 mm. Tuberculin skin tests, negative. Chest roentgenogram on October 5, 1943, postero anterior (Fig 1) and right lateral (Fig 2) showed a circular opacity on the right side, posteriorly situated with an area of atelectasis distal to it. Bronchogram on October 7, 1943, revealed a lack of filling of the bronchus to this area.

Bronchoscopic examination was performed by Dr L McPherson on October 12, 1943. Trachea, carina and right main stem bronchus were normal. The middle lobe and lower lobe bronchial orifices and spur were normal, but bleeding, which appeared to come from the superior segmental bronchus of the lower lobe, was encountered. On October 14, a diagnostic pneumothorax was instituted and a free pleural space found. On November 3, an exploratory right thoracotomy was performed by Dr G F Skinner and Dr L McPherson. The right lower lobe was markedly shrunken and atelectatic in the posterior lower portion. Just below the hilus in the lower lobe was a hard rounded mass, about one and one half inches in diameter. The lower lobe was removed by individual hilar ligation.

Pathological report from Dr A Branch, Provincial Laboratory was as follows, "section right lower pulmonary lobe. Portion of what appears to be base of lung 10.5 cm diameter, with ragged pleura, containing a firm encapsulated nodule 4 cm in diameter. On section it has a homogeneous pale yellow colour. Microscopic sections show tumour to be composed of masses of cuboidal epithelial cells arranged partly in alveolar fashion and partly in solid cords. There is a loose stroma around the clumps of cells but not between them. Here and there more dense fibrous tissue is seen in



Fig 1

Fig 2

Fig 3

Fig 1 (Case 1)—October 5, 1943. Postero anterior. Circular opacity on right with distal atelectasis. Fig 2 (Case 1)—October 5, 1943. Right lateral. Opacity and atelectasis situated posteriorly. Fig 3 (Case 1)—March 28, 1944. Postero anterior. After right lower lobectomy.

strands and in one place a piece of cartilage. No mitoses were found. Diagnosis—Adenoma.

The specimen was then sent to the Army Medical Museum, Washington, and their microscopic report is: "Microscopic Section reveals fragments of neoplasm made up of nests of small homogeneous cells containing moderately hyperchromatic nuclei and showing rare mitotic figures. Portions of the stroma are mucoid or hyalinized. In places the tumour appears encapsulated. In other areas it invades the stroma in small nests. Diagnosis—So-called adenoma of bronchus."

This patient made an uneventful recovery and was discharged December 15. A chest roentgenogram March 28, 1944 (Fig 2) shows partial removal of the fifth rib and disappearance of the former opacity in the right lung. She has remained well.

CASE 2

M.H., a white female, aged 34 years, was admitted to the Saint John Tuberculosis Hospital on June 23, 1944. She gave a history of frequent head and chest colds during the winter months for as long as she could remember. In October, 1943, she had a brisk blood spitting, with sudden onset and stoppage. She immediately consulted a physician, at which time her temperature was 103°. She then spent one month in a sanatorium, where several chest roentgenograms were taken, and she was told she had not tuberculosis but pneumonia. On discharge she resumed her work feeling well until February 14, 1944, when she again had brisk blood spitting lasting five hours. After remaining in bed one day she felt well and resumed working. On May 27, she again had a brisk bleeding. On May 30, another chest roentgenogram was taken and she was referred here for consultation and treatment. Since May 27, she has had an irritating cough but feels well and has not lost weight. On admission she appeared healthy and well nourished. Temperature 99°, pulse 90, blood pressure, systolic 104, diastolic 50. The only abnormal physical findings were confined to the right posterior thorax, where the percussion note was dull in the lower third with markedly diminished breath sounds over this area.

Laboratory data—Hemoglobin 74% (11.54 gm), erythrocytes 3,850,000, leucocytes 12,600. Differential—Polymorphonuclears 57%, lymphocytes 35%, monocytes 5%, basophils 3%. Urinalysis, normal. Kahn, negative. No sputum.

Chest roentgenograms—On October 14, 1943 (Fig 4) there is obscuration of lower right lung from diaphragm up to lower border of third rib, with greater density medially and increasing aeration laterally. On November 13, (Fig 5) a circumscribed opacity is evident in the fourth interspace on the right side. There has been clearing of the previous homogeneous density.



Fig 4



Fig 5

Fig 4 (Case 2)—October 14, 1943. Postero-anterior. Homogeneous density in lower lung field. Fig 5 (Case 2)—November 13, 1943. Postero-anterior. Circumscribed opacity in right lower lung field. Fig 6 (Case 2)—June 27, 1944. Left lateral. Bronchogram. Lack of filling of posterior basilar segment bronchus. Area of atelectasis situated posteriorly.

Bronchogram of June 27, (Fig 6) shows lack of filling of posterior basilar segment bronchus to this level of opacity. A bronchoscopic examination was performed by Dr. Macpherson on July 7 but such profuse bleeding occurred on touching the tumour that a satisfactory specimen could not be obtained. He repeated the examination on July 18. Only the right bronchus was entered and the shiny and round tumour mass was seen to be in the basal bronchus. This tumour appeared to move up and down with coughing. A specimen was removed and copious bleeding again occurred.

Pathological report from Dr. A. Brauch reads: "Intra-bronchial tumour. Microscopic. This is a neoplasm which imparts one as being of the adenomatous type rather than a carcinoma."

On September 13, a right lower lobectomy was performed.

Pathological report from Dr. A. Brauch: "Right lower pulmonary lobe, showing fibrous adhesions on the anterior surface. Only atelectasis seen in the posterior portion. Main bronchus has been opened by surgeon to expose intrabronchial mass 2 x 4 cm which is attached to a wide pedicle. Invasion does not appear to have extended beyond the bronchus. There is some yellow mucopus localized in the bronchus below the tumour."

"Microscopic—Two sections examined of the tumour and its attachment to the bronchus. The tumour is composed of small uniform cells arranged in alveolar fashion with fine trabeculae. There are no mitoses and no extensions into the cartilage which is surrounded. The bronchi are dilated and surrounded by collars of lymphocytes and there is contiguous atelectasis of the lung parenchyma. Diagnosis: Bronchial adenoma with extension into wall."

This patient's postoperative course was uneventful and she was discharged October 16. She has remained well.

These bronchial adenomas occur more frequently in females than in males. In Brunn and Goldman's series of 14 cases 64% were females. Symptoms usually develop under 40 years of age, while 90% of the victims of bronchial carcinoma are over 40, according to Weber.⁵

A history of recurring attacks of pulmonary infections with long intervals of good health, as in our first case, is very suggestive of a benign intrabronchial tumour. Sudden brisk

bleeding, the presenting symptom in our second case, may be the first symptom. This bleeding often begins and ends abruptly. In women the pulmonary bleeding has at times coincided with the menses. The hæmoptysis is usually copious, in contradistinction to the streaking which occurs as a later symptom in bronchial carcinoma. Both Brunn and Goldman⁴ and Ralph Adams⁵ have stressed the difference in character of the pulmonary bleeding in these two types of neoplasm. In Jackson's² series of 20 cases of bronchial adenoma, 12 had hæmoptysis, and 2, streaking. In the case reported by Riordan and Richards,³ recurrent hæmoptysis had been present for twenty years before a diagnosis of bronchial adenoma was made by bronchoscopic biopsy.

If this tumour produces a partial obstruction of the bronchus, wheezing and asthmatoïd symptoms may be the initial complaint. With interruption of normal bronchial drainage there may develop a distal pneumonitis or "pneumonia" or bronchiectasis or lung abscess. Empyema may result. Complete obstruction of the lumen of the bronchus will produce a distal atelectasis. If the pulmonary suppuration is not overwhelming these patients may continue for years in a state of good nutrition. Some succumb to the pulmonary infection, the diagnosis of bronchial adenoma being made on post mortem examination.

DIAGNOSIS

If sufficient time and consideration is given to obtaining a complete history much valuable information is received, as illustrated in our first case. The symptoms are not diagnostic, as similar ones may be produced by many bronchial tumours and by many pulmonary diseases. Tempel,⁷ in his very complete outline of the diagnostic criteria of chest tumours, says the important thing to remember is to consider tumours as well as an inflammatory process as the cause of symptoms. Roentgenological examinations, which should include fluoroscopy as well as positional films, will show some pulmonary abnormality. Rarely, if ever, will this examination be negative when the patient consults a physician because of symptoms. If a circumscribed opacity is seen, a lung tumour is immediately considered. However, the findings may be an atypical pneumonia, as in our second case, a pneumonitis, an area of atelectasis or localized emphysema, a lung abscess

or empyema. Further investigation is then indicated to determine the cause of the abnormal chest roentgenogram.

The bronchogram may show localized bronchiectasis or there may be evidence of bronchial obstruction, as in both of our cases. Weber⁸ considers a "cap shaped" deformity of the bronchial outline, due to a layering of the opaque oil over the round, smooth intrabronchial mass, characteristic. Sputum examinations and hæmograms are a routine procedure today, but are not specifically contributory in establishing the diagnosis of bronchial adenoma. The bronchoscopic examination showing a smooth, rounded, pinkish or purplish polypoid tumour, when seen, is characteristic. However the vascularity of the tumour which bleeds so readily, may prevent the obtaining of a suitable biopsy specimen. In our first case no specimen was obtained, while in the second case, a second bronchoscopy was necessary before satisfactory tissue for biopsy could be removed. A positive diagnosis of bronchial adenoma was made from this biopsy. A bronchoscopic biopsy affords the only means of establishing a definite preoperative diagnosis of bronchial adenoma.

PATHOLOGY

In their table of classification of polypoid bronchial tumours according to growth potential and microscopic appearance, Brunn and Goldman¹ categorize the adenoma as a local epithelial tumour without metastases. Graham and Womack³ suggest that these tumours may have a common origin with such connective tissue tumours as chondroma, osteoma, fibroma, lipoma, angioma, myxoma and sarcoma, all being derived from disorganized embryonic bronchial buds.

These bronchial adenomas are found in the lumen of the larger bronchi. Three morphological types have been described, a pedunculated endobronchial, a second with a larger intramural portion and a third "extra endobronchial" in which the extrabronchial portion is larger than the endobronchial.

Grossly, they have a smooth, rounded pink to purplish appearance and are soft and vascular. Microscopically, they are covered by bronchial epithelium, which may have undergone squamous metaplasia. The cells are small and uniform, cuboidal or polygonal in shape, and arranged in alveolar or cylindromatous

patterns. The appearance and arrangement of the cells as just described, was found in each of our cases and is considered characteristic. The stroma is composed of fibrous tissue and blood vessels. Mitoses may be present in the capillary endothelial cells but there is no evidence of "unruly growth".

These tumours grow slowly, but eventually as a result of the bronchial obstruction and subsequent pulmonary suppuration produce fatal results. Jackson *et al.*¹ concede that these tumours may undergo malignant change but have not observed this in their series. Adams, Steiner and Bloch² in 1942 reported five cases of "malignant adenoma of the lung". They found tumour cells in regional lymph nodes, invasion of the bronchial wall or distant metastases. One case had true metastases in the liver and another in a lumbar vertebral body.

Anderson¹⁰ in 1943 reported a case having a history of eight years' duration before dying, following a sudden attack of dyspnoea, within four days of admission to hospital. The autopsy revealed a large bronchial adenoma arising in the right main bronchus just below the bifurcation of the trachea, and a nodule in the liver, which on macroscopic examination was composed of tissue identical with that found in the tumour of the bronchus. Graham and Womack⁸ in 1945 added another case to their seven previously reported in 1938 in which invasion of adjacent tissues or involvement of regional lymph nodes had occurred. Their eighth case had remained "benign" for twenty years before succumbing. Post-mortem examination was then reported as showing "a large mass of cancerous tissue in liver and lung".

It would appear that although histologically these tumours may be considered "benign" some will eventually manifest evidence of malignancy by invasion of adjacent tissues by involvement of regional lymph nodes or by distant metastases.

TREATMENT

The morphological characteristics of these tumours are such that one cannot be assured of complete endobronchial removal. As there is now sufficient evidence of the potentially malignant nature of these adenomas complete extirpation of the tumour mass is desirable. In order to accomplish this the lung lobe in which the tumour is situated should be removed. Chamberlain and Gordon¹¹ advise also the re-

moval of mediastinal glands at the time of operation, as they are occasionally involved. In their presentation of results in ten cases of bronchial adenoma they encountered lymph node involvement in five cases. In neither of our cases were enlarged glands found at time of operation.

An additional indication for lobectomy exists if there is localized bronchiectasis or chronic pulmonary suppuration distal to the tumour. In our first case the lower lobe was markedly shrunk and atelectatic in the posterior lower portion. In both cases yellow mucopus was present in the bronchus below the tumour. With the development of a relatively safe technique for pulmonary resection, lobectomy is considered the treatment of choice in these cases.

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PROGRESS REPORT ON A CASE OF AURICULAR FIBRILLATION DEMONSTRATED IN AN INFANT OF THREE MONTHS

By Alton Goldbloom, M.D. and
Harold N. Segall, M.D.

Montreal

In 1935 we observed an infant aged 3 months, in whom auricular fibrillation had been present probably since birth and perhaps before birth. We reported the case in 1938.¹ A thorough search of the literature has revealed no other case of this kind before or since. Recently Ludken and Ruggel² described a rare type of "fleeting paroxysmal auricular fibrillation" in an infant of 3 months in whom auricular fibrillation occurred in the diastolic period between two normal sinusoidal rhythm beats. In our case which was of the usual persistent type neither digitalis nor digitalis therapy had any effect on the auricular rhythm which became normal spontaneously. The child has continued to thrive

An electrocardiographic record showing normal rhythm was made in 1936

The child was next seen by one of us (HNS) on June 28, 1944. There had been no recurrence of auricular fibrillation. When the child was thirteen months old, gastrostomy had been performed for the removal of an open safety pin. At the age of 7 years, she had a severe "streptococcus sore throat" and was treated with sulfonamides. She had a high fever for three days and was ill for a week. Later in the same year, she had chickenpox. She had not had any other illness. Her habits and behaviour were those of a normal child of 9 years. Physical examination revealed her to weigh 59 lb, her weight was 53", one small lymph node was felt on each side of the neck. All other clinical signs were within the normal range for her age. The cardiac apex was felt 6 cm to the left of the midsternal line in the 5th intercostal space. At the apex in the left lateral recumbent posture, a short, coarse auricular sound was heard preceding the first sound and a slightly rumbling third heart sound was heard after an interval of quiet following the second sound. The third sound was heard as a somewhat shorter thud at the

apex with the patient in the dorsal recumbent posture. There was also a rather coarse, short systolic murmur, restricted to the interval between the first and second sound, loudest at the aortic area but heard also along the left border of the sternum and at the apex. These features were considered as within the range of normal. The blood pressure was 100 systolic and 60 diastolic.

Fluoroscopic examination of the chest revealed no abnormalities in the lung fields. The heart was of normal shape and size. The measurements were aortic arch 3.3 cm, right border 2.9 cm, left border 6.2 cm, transverse diameter of chest 20.0 cm. There was no evidence of left auricular enlargement in the posterior mediastinum and the pulmonary conus was well within the normal range. Electrocardiogram revealed sinus arrhythmia, rate 90 to 116, P-R interval 0.16 of a second, QRS 0.08 of a second. Normal electrical axis. Juvenile type of T waves in Leads CF-2 and CF-4. This record revealed no abnormalities.

She was last examined (HNS) on April 10, 1946. Her general appearance was that of a normal, healthy girl of 11 years. She was in 5th grade at school and engaged in the usual

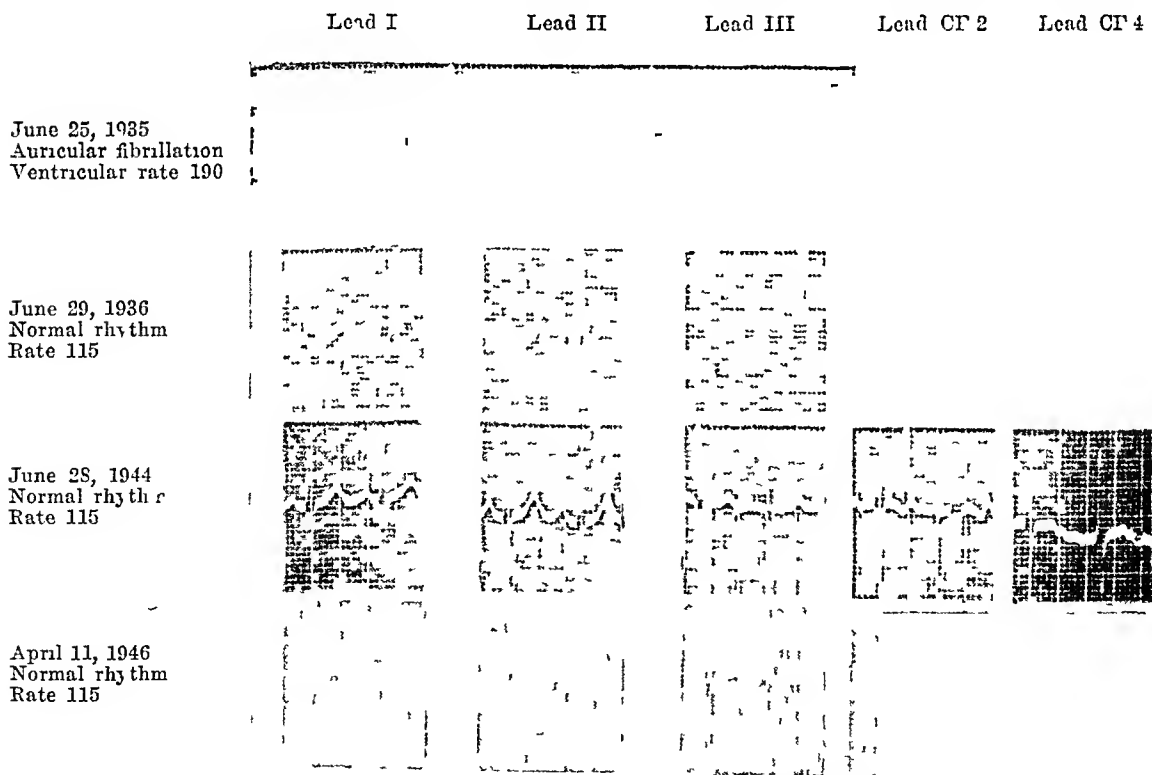


Fig 1—Electrocardiogram of June 25, 1935, reveals auricular fibrillation with coarse auricular waves. Subsequent electrocardiograms reveal normal rhythm with slight variations in amplitude and shape of Q R S T complexes related to normal growth.

childhood sports, including riding a bicycle. She had not had any acute illness. By percussion no evidence of cardiac enlargement could be established. The cardiac apex was maximal in the 5th left intercostal space 6 to 6.5 cm from the midsternal line. The heart sounds were of good loudness and quality. During inspiration only the second sound was everywhere duplicated, its earlier part being a loud sound and its latter part a faint, short sound. No third sound or diastolic murmur could be detected. A short, coarse, crescendo, somewhat superficial systolic murmur was heard at the left border of the sternum near the 4th intercostal space in the sitting position only. At the apex, in the sitting and left lateral recumbent posture, a very faint short systolic murmur between the first and second sounds could be detected. A similar systolic murmur was detected at the aortic area. The blood pressure was 112 systolic and 80 diastolic. The electrocardiogram (Fig. 1) recorded in the dorsal recumbent posture revealed normal rhythm rate 115, P-R interval 0.16 of a second, QRS 0.06 of a second. Normal electrical axis. The S wave in Leads I and II was of lower voltage than it was in 1944, when it also showed lower voltage than the records of 1936 and 1935. The R wave in Lead III was of about the same voltage as in 1944 but lower than in 1936. The chest leads CF-2 and CF-4 were similar to what they were in 1944. The tachycardia was of the functional type as the child was in a state of moderate tension at the time. The new features of the heart sounds and murmurs may be ascribed to variations which occur with growth. The auricular and 3rd sound had disappeared.

This patient had auricular fibrillation early in infancy, probably at birth and, once normal rhythm had been established at about the age of one year there were no recurrences of auricular arrhythmia. When she was first observed to have normal rhythm in 1936 it was supposed that she might very well have recurrences of auricular arrhythmia such as auricular premature beats, auricular flutter or auricular fibrillation etc. at some time in the future. This has not happened in the past ten years but must be considered as a future possibility.

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SITUS INVERSUS

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The incidence of complete situs inversus has never been accurately estimated. Bauer in 1912 quotes various authors who give figures ranging from 1/2,000 to 1/35,000. Larson in 1938 thought the incidence was about 1/10,000. At that time Larson stated about 475 cases had been reported in the literature. The condition is usually said to occur about twice as frequently in men as in women, although Cockayne did not find this in his series. The higher incidence in men is probably due to the greater frequency of routine examinations of men as for insurance, industry and armed forces.

Cockayne in 1938 after a study of family pedigrees came to the conclusion that complete transposition of the viscera is inherited as a recessive and is determined by a single autosomal gene. The majority of his patients were right-handed although some were left-handed and two were ambidextrous.

Two theories concerning the etiology have been proposed. One suggests that the condition is due to the survival of one of two twins. According to the other theory the thoracic and abdominal organs are at first median and symmetrical. Transposition of the viscera consists of the formation of a sinistral instead of a dextral spiral. This latter theory seems much the more reasonable one.

Any disease which occurs in normal individuals may occur in people with situs inversus. However congenital abnormalities tend to be high and the Kartagener triad of situs inversus, sinusitis and bronchiectasis, has become familiar since Adams and Churchill brought it to the attention of the American literature in 1937. Kartagener had written about the association of these conditions in 1933. Of abdominal conditions peptic ulceritis has been frequently described and gall bladder disease occasionally. The symptoms described were not always on the same side as the diseased organ.

In the literature we have found only two cases of peptic ulcer. One of these had perforated

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and was operated on. No mention is made as to the localization of the pain. In the other there was pain and tenderness in the epigastrium referred neither to right nor left. No record of gastrectomy in any case of situs inversus could be discovered. The following case seems to be the first in which gastrectomy was performed.

CASE HISTORY

O G, a 34 year old sergeant, was admitted to the Medical Service of Montreal Military Hospital on March 22, 1944 complaining of a heavy sensation in the upper abdomen, accompanied by belching and heartburn, relieved by milk and alkalies. Symptoms had been present for about a year. There had been some vomiting 10 days before admission. He had been in hospital previously in 1930 for an appendectomy when situs inversus was discovered. He had had gastric complaints off and on since 1933 for which he was x-rayed in 1937 when no ulcer could be found on barium series.

The family history was irrelevant except that the father had died of carcinoma of the stomach at the age of 45 years.

Physical examination showed the heart dullness to be to the right of the sternum. Sounds were normal. Blood pressure 150/110. The abdomen was symmetrical and showed an old mid line incision below the umbilicus. Liver dullness was on the left side. The right testicle was lower than the left. Physical examination was otherwise negative. Electrocardiogram showed the typical findings of dextrocardia with complete inversion of all complexes in lead I. An electrocardiogram was then taken with leads reversed in the arm and on the right instead of the left leg. This electrocardiogram was normal except for slight left preponderance and some QRS changes compatible with his hypertension and body build (Fig 1).

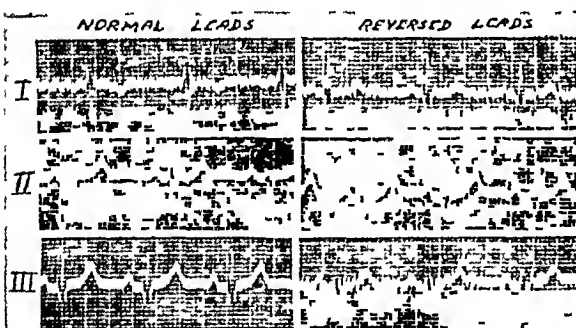


Fig 1—Tracing taken with usual leads and with reversed leads. The first tracing is typical of situs inversus. The second one shows the findings one might expect in hypertensive cardiovascular disease.

X-rays taken March 23, revealed complete situs inversus (Fig 2). The barium series showed the stomach to be high in position on the right side with moderately coarse tortuous rugae. The duodenal cap was very spastic and did not fill out well at any time during the examination. An ulcer crater was present in the pyloric antrum in the immediate prepyloric region on the greater curvature side. There was some pylorospasm and coarsening of the mucosal pattern in the duodenal loop (Fig 3).

Gastric analysis showed hyperacidity in the fasting specimen. The test meal was otherwise not remarkable. He was put on a Sippy diet with the use of aluminum hydroxide gel but his symptoms became worse.

When re-x-rayed on April 17, the barium series was essentially similar to the first examination with the

exception that the ulcer crater seemed more prominent. The appearance at that time suggested that the crater lay at the tip of a diverticulous pouching of the pyloric antrum. The duodenal cap was not grossly deformed nor was there evidence of crater formation. Aluminum hydroxide gel in continuous drip with milk was now tried but gave very unsatisfactory results. X-ray taken April 27, showed an apparent increase in

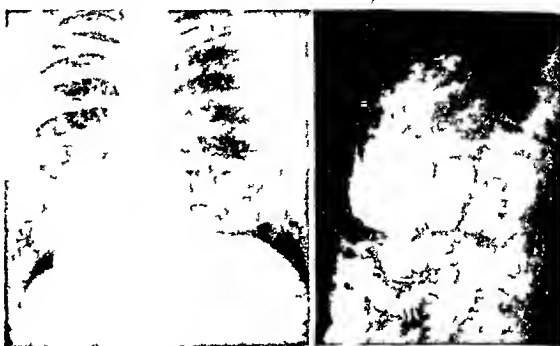


Fig 2

Fig 3

Fig 2—Transposition of the thoracic viscera. The stomach bubble can be seen on the right side. The hemidiaphragm on the left is higher than the right and the solid shadow under it is indicative of liver.

Fig 3—Another view during the barium series. The arrow points to the ulcer.

the size of the ulcer crater. It was obvious that medical treatment was not helping him and he was then transferred to the surgical service. Delay occurred in operation while permission was being obtained for gastrectomy. X-rays taken May 18, were essentially similar to previous ones except that the duodenal cap was again spastic.

Operation report—Under spinal anesthesia a mid line incision was made from the ensiform cartilage to the umbilicus. The stomach was found to be in the right upper quadrant. The gall bladder and lobes of the liver appeared to be normal except for their left sided position. The ligament of Treitz and the jejunum were to the right of the mid line below the mesocolon at about the level of the third lumbar vertebra. The ulcer was found to be lying on the lesser curvature of the first part of the duodenum about one inch beyond the pylorus. At this site there was considerable scarring, with adherence to the pancreas. The stomach was removed by the Hofmeister Finsterer technique which presented no unusual difficulties or problems excepting for the reversed position of the stomach.

The postoperative course was uneventful. X-rays taken July 6, still showed some coarsening of the rugae in the remaining portion of the stomach and duodenum. The man has been back at work and feels well since his discharge from hospital July 7.

SUMMARY

A case is presented of situs inversus with duodenal ulcer for which subtotal gastrectomy was successfully performed.

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SPECIAL ARTICLE

PHYSIOLOGICAL CONSIDERATIONS OF THE ETIOLOGY AND TREATMENT OF OBESITY

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ETIOLOGY

Obesity is due to an excessive deposition of fatty tissue. This, in turn, is due to a disproportion between the energy intake in the form of food and the energy output in the form of work. The question arises whether this disproportion is the result of an excessive intake of food or of a subnormal output of energy. Newbough, Evans, as well as many others, claim that it is invariably due to an excessive food intake. Others on the other hand contend that the fault is usually that of the energy output, and cite examples of people who gain weight when they do not overeat and of others who fail to lose weight when they are underfed. There has therefore been a continued search for some metabolic abnormality in obese people.

Energy metabolism.—It is the widespread opinion that a very large proportion of obese people gain weight because of a subnormal energy expenditure which is reflected in a low basal metabolic rate. However, the belief that the B.M.R. is low in obese subjects has been shown to be erroneous. Boothby and Sandiford¹ measured the basal heat production in 94 obese patients and found that in 81% the B.M.R. values were within 10% of the normal. In only three instances did the rates fall between -16 and -20%. Furthermore, one patient exhibited a B.M.R. of +16%. Among 180 cases of extreme obesity Giff² found only 3 in which there was a definite decrease in the B.M.R. Normal B.M.R. values in the majority of obese people have also been reported by Means,³ Duhon,⁴ and others. It is therefore apparent that the occasional moderately low rate (i.e. -15 to -25%) exhibited by an obese person does not enlighten us as to the etiology of obesity, since equally low rates are encountered as frequently among persons of normal weight. The few with very low B.M.R. values probably suffer primarily from myxedema.

Not only does one fail to find the basal metabolism low in obese people, but observations have been made repeatedly that the basal calories per day are higher in the obese than in normal. In the former they lie between 2,000 and 2,200 as compared with 1,400 to 1,600 in the latter. But, since it has been demonstrated by Means³ that the increase in surface area in the obese is proportional to

their greater basal oxygen exchange, their B.M.R. determined in this way is normal despite the higher level of oxygen exchange. However, the total heat produced by the obese person in the basal state is greater actually than the total heat produced by normal people. Therefore, if one should relate the O₂ consumption to the ideal, not the actual weight and surface area, one will find a high level of O₂ exchange in relation to the active vital body tissues of the obese as represented by their ideal weight. On the basis of such calculations many obese will exhibit B.M.R. values as high as +25 to +30%. The level of O₂ exchange of the obese in excess of that which would be normal for their ideal weight is considered by Strang and Evans⁵ as a measure of the physiologic stimulus of their excess weight. Proof of this point of view is afforded by the fact that when the obese attain a reduction of weight by diet alone there is a concomitant lowering of the O₂ exchange, presumably by removal of the added work.

Newbough and his co-workers⁶ went further and devised a method of calculating the dissipation of energy for any desired length of time without curtailment of activity. This method is based on the measurable loss of weight due to evaporation of water from the skin and lungs and the heat lost in this way. They investigated normal and obese cases of various types. In no case of obesity did they find anything unusual about the total metabolism. The obese did not exhibit any capacity to live on a lesser expenditure of calories than normal. In fact, just the opposite was true. Their total expenditure of energy was large and thus indicated that they produced considerably more heat than did normal persons of the same height, age and sex whose weight was normal. The findings were in accord with those of Lauter⁷ who demonstrated that an obese subject requires more energy to perform a given piece of work than does a normal control.

Specific dynamic action.—A person loses more heat after consumption of food than before. It is known that this response is not caused by digestion or absorption, since the increased heat loss is equally great after the intravenous administration of glucose or of some of the amino acids as after the ingestion of an equal quantity of carbohydrate or protein. It has furthermore been shown that this specific dynamic action is greatest after the consumption of protein.

It has been claimed by some that many persons gain weight because of an abnormally low specific dynamic action. Strang and McClogage,⁸ who took great pains to establish a true base line at the beginning of their tests were unable to demonstrate any depression of the specific dynamic action in the obese. Furthermore, the small specific dynamic action which has been reported by some, if real and not the result of

misleading computations with observed data, could account for no more than a 3% reduction in the total daily metabolism¹⁰ This, if present, would contribute somewhat to the acquisition of obesity, but is wholly inadequate to account for the facts in most cases

Water metabolism—Water balance studies have often been found to explain the discrepancy between the decreased food intake and the failure to lose weight Some obese persons, when placed on an extremely low-calorie diet, frequently fail to lose weight during the first few days of rigid dieting It has, however, been observed that after several days these patients will lose weight very rapidly, and at the end of a certain period their weight loss will be such as expected from energy balance calculations Water balance studies by Newburgh and his collaborators^{11,12} show that this initial failure to lose weight is due to excessive retention of water caused by the low calorie intake This has been found not to be particularly specific for obese subjects, since undernutrition will cause the same phenomenon in the normal After several days diuresis takes place and the subject shows the loss of weight expected from his low-calorie intake Cycles of periods of water retention and diuresis may become more conspicuous as the period of dieting continues The extent and duration of these swings varies widely However, over a long period the up and down swings of water exchange will balance and the scales will show the true weight loss due to the removal of fat

Other cases, on the other hand, will show, shortly after commencing a restricted diet, a loss of weight in excess of that expected¹⁰ This is probably due to the fact that some have a mild degree of congestive heart failure, even though no oedema can be clinically demonstrated, and that the institution of the restricted diet is followed by a prompt establishment of cardiac compensation and the loss of unrecognized oedema A similar early excessive loss of weight occurs when the myxoedematous patient is placed on thyroid therapy

ENDOCRINE OBESITY

This designation is frequently observed in case reports and in medical literature Obesity of endocrine origin is a very common diagnosis and is particularly applied to those obese cases who fail to lose weight satisfactorily, thus reserving the description for a sort of mysterious type of obesity Strang and Evans,⁵ while studying the O_2 exchange of obese patients undergoing reduction by limited diet alone, found no difference in response between so called "endocrine obesity" patients and those who operate Freyberg and Newburgh¹³ in a study of energy exchange of a verified case of pituitary basophilism observed no variation from that known for other obese cases By controlled diet the expected, calculated loss of weight was almost

the same as the actual loss The term "endocrine obesity" therefore does not designate any particular class of obese persons with a specific energy metabolism It is useful only in describing the location and distribution of excess fat

Thyroid—It is very common to see a case diagnosed as obesity due to hypothyroidism because the BMR is between -10 and -25% Newburgh⁷ criticizes this on two grounds (1) The alleged normal BMR is too high People who undergo several BMR estimations and are completely relaxed will show lower BMR values than the so called normal (2) When hypometabolism is not associated with the clinical features of myxoedema the subject is not hypothyroid

Finally a low basal metabolism need not cause obesity This was shown by the experiments of MacKay and Sherrill¹⁴ on rats The thyroid was removed from a group of rats 170 days old and a similar group used as a control Both groups were placed on the same diet, 310 days later the controls had gained 193 gm whereas the thyroidectomized animals gained only 178 gm Furthermore, the bodies of the controls contained 31.1% fat whereas those of the thyroidectomized rats contained only 6.4% fat Since the weights of the latter animals were quite close to those of their controls it was assumed that oedema fluid accounted for part of the weight increase in the thyroidectomized animals

Plummer¹⁵ studied 200 patients suffering from various grades of myxoedema 61.5% were overweight In 8.5% the weight was more than 50 lb above normal, but in 5.5% it was more than 30 lb below normal However, those whose BMR's were lowest weighed least, and those whose rates were not less than 28% weighed 11.5% too much, whereas those whose rates were less than -28% weighed 14.7% too little The average excess weight for the whole group was 10.1 lb During the first days of thyroid medication there was an abrupt loss of weight that averaged 13 lb This was brought about by diuresis since most were oedematous prior to treatment Now the group weight had become 2.9 lb less than normal The excessive weight in hypothyroid patients so commonly attributed to fat is more properly interpreted as evidence of the accumulation of fluid

Pituitary—The clinical diagnosis of "pituitary obesity" is very commonly made, although there is no such entity Ever since the description of Frohlich's syndrome in 1901 it has been popularly believed that a pituitary tumour or the destruction of pituitary tissue by the tumour gives rise to obesity This gained favour when Cushing¹⁶ supported this claim and reported that partial extirpation of the pituitary in dogs gives rise to obesity This claim, however, has been proved to be incorrect,

for, as will soon be seen, in such cases the obesity is due not to removal of pituitary tissue but to the simultaneous injury of the hypothalamus. In the true Frohlich's syndrome, too, obesity is apparently due to injury of the hypothalamus.

Furthermore, it has been an unfortunate practice to refer to every case of obesity and hypogonadism in children as Frohlich's syndrome, or pituitary obesity, even though a pituitary tumour is never found. Actually, except for the obesity, these are perfectly normal children who grow up to be perfectly normal adults. Such boys are usually erroneously referred to as hypogonadal as the penis appears small only because it is embedded in a considerable amount of supra-pubic fat, when one retracts the supra-pubic tissue the penis appears normal in size.

On the other hand destruction of the pituitary results not in obesity but, on the contrary, in cachexia. The picture of Simmonds's disease with the marked emaciation is well known and this condition is the result of destruction of anterior pituitary tissue.

In Cushing's syndrome there is a plethoric obesity confined chiefly to the head and trunk. This is in many cases due to a basophilic adenoma of the pituitary. In many there is no pituitary tumour. In some there is a tumour of the adrenal cortex. Actually there is no marked obesity in the true Cushing's syndrome and the appearance of a large chest and abdomen is deceptive and is mainly the result of a narrowing or collapsing of the vertebrae and a relaxation of the abdominal muscles.¹⁷⁻¹⁸

Hypothalamus—Philip Smith¹⁹ was the first to demonstrate that in rats careful removal of the pituitary does not cause obesity whereas injury to the hypothalamus does result in such. He explained that in the dog hypophysectomy does give rise to obesity because of the unavoidable injury to the hypothalamus during the operation. Hetherington and Ranson²⁰⁻²¹ have recently shown in the rat that firstly simple hypophysectomy does not produce obesity and secondly that even denervation of the pituitary by cutting the nervous pathways to it or section of the pituitary stalk is without effect on the production of obesity as long as no hypothalamic injury is involved. On the other hand large symmetrically placed lesions of the hypothalamus produce obesity in all the rats. They deduce that the presence of the pituitary is not essential to the appearance of hypothalamic obesity and that the response seems to be caused by the severance of the pathways which descend from the hypothalamus. Recent work on dogs by Hembecker and White²² and by Hembecker, White and Rolf²³ demonstrated that hypothalamic obesity is due to bilateral injury of the posterior hypothalamus which causes retrograde degeneration of the cells of the paraventricular nuclei. The cell loss of most significance in causing obesity

is from the caudal portion of these nuclei and must be bilateral. The maximum degree of obesity results when the entire paraventricular nucleus disappears, partial loss results in only moderate obesity. These workers also claim that obesity develops more rapidly when the supraoptic-hypophyseal system innervating the pituitary-forming tissue of the pituitary is totally or nearly totally inactivated, that is, when total or near total diabetes insipidus exists.

C N H Long and his associates²⁴⁻²⁶ studied the metabolism in hypothalamic obesity. They placed bilateral, symmetrical lesions in the hypothalamus of rats. Almost immediately after the operation these animals began to eat voraciously, often two to three times as much food as eaten by their littermates, and soon became very obese. Ten rats with operation were paired with their controls, they frequently ate their day's ration in less than two hours but did not gain any more weight than their controls. The oxygen consumption in the surgical animals was found to be normal. The authors therefore regard the development of obesity in these animals as a consequence of increased appetite and not the result of any fundamental metabolic disturbance.

TR TMENT

Diets—Limitation of diet is still the principal way to obtain an effective reduction of weight. All diets devised to reduce weight are founded upon an attempt to compel the body to utilize its own fat for supplying part of the energy it requires. The average normal person requires daily an amount of energy equivalent to about 2500 calories of heat. This energy is normally supplied by the food we eat. Therefore if we reduce the total calorie intake below the energy requirements, the fat stored in the body will be called upon to make up the deficiency. The body fat becomes transformed into a utilizable form which supplies energy during muscular work. Hence, the body weight is gradually reduced. The essential feature of a reducing diet is therefore a restriction of its total number of calories.

Studies by Block⁶ in Newburgh's laboratory indicate that obese persons release fat from fat stores as a source of energy as readily as normal people. This is in direct contradiction of Hetenyi's theory of "lipophilia", whereby he postulates that in the obese person the fat from fatty tissue is not as easily available as a source of energy as in the normal. In fact Block's studies suggest that it is likely that the obese release the fat from fatty tissue more readily than the normal, since they usually lose less nitrogen than the normal when they are underfed. Furthermore, in the obese the respiratory quotient, both in the fasting state and after a meal, is lower than in controls, that is, they metabolize more fat.

misleading computations with observed data, could account for no more than a 3% reduction in the total daily metabolism.¹⁰ Thus, if present, would contribute somewhat to the acquisition of obesity, but is wholly inadequate to account for the facts in most cases.

Water metabolism—Water balance studies have often been found to explain the discrepancy between the decreased food intake and the failure to lose weight. Some obese persons, when placed on an extremely low-calorie diet, frequently fail to lose weight during the first few days of rigid dieting. It has, however, been observed that after several days these patients will lose weight very rapidly, and at the end of a certain period their weight loss will be such as expected from energy balance calculations. Water balance studies by Newburgh and his collaborators^{7, 11, 12} show that this initial failure to lose weight is due to excessive retention of water caused by the low-calorie intake. This has been found not to be particularly specific for obese subjects, since undernutrition will cause the same phenomenon in the normal. After several days diuresis takes place and the subject shows the loss of weight expected from his low-calorie intake. Cycles of periods of water retention and diuresis may become more conspicuous as the period of dieting continues. The extent and duration of these swings varies widely. However, over a long period the up and down swings of water exchange will balance and the scales will show the true weight loss due to the removal of fat.

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the same as the actual loss. The term "endocrine obesity" therefore does not designate any particular class of obese persons with a specific energy metabolism. It is useful only in describing the location and distribution of excess fat.

Thyroid—It is very common to see a case diagnosed as obesity due to hypothyroidism because the BMR is between -10 and -25%. Newburgh⁷ criticizes this on two grounds: (1) The alleged normal BMR is too high. People who undergo several BMR estimations and are completely relaxed will show lower BMR values than the so-called normal. (2) When hypometabolism is not associated with the clinical features of myxoedema the subject is not hypothyroid.

Finally a low basal metabolism need not cause obesity. This was shown by the experiments of MacKay and Sherrill¹⁴ on rats. The thyroid was removed from a group of rats 170 days old and a similar group used as a control. Both groups were placed on the same diet, 310 days later the controls had gained 193 gm whereas the thyroidectomized animals gained only 178 gm. Furthermore, the bodies of the controls contained 31.1% fat whereas those of the thyroidectomized rats contained only 6.4% fat. Since the weights of the latter animals were quite close to those of their controls it was assumed that oedema fluid accounted for part of the weight increase in the thyroidectomized animals.

Plummer¹⁵ studied 200 patients suffering from various grades of myxoedema. 61.5% were overweight. In 8.5% the weight was more than 50 lb above normal, but in 5.5% it was more than 30 lb below normal. However, those whose BMR's were lowest weighed least, and those whose rates were not less than -28% weighed 11.5% too much, whereas those whose rates were less than -28% weighed 14.7% too little. The average excess weight for the whole group was 10.1 lb. During the first days of thyroid medication there was an abrupt loss of weight that averaged 13 lb. This was brought about by diuresis since most were oedematous prior to treatment. Now the group weight had become 2.9 lb less than normal. The excessive weight in hypothyroid patients so commonly attributed to fat is more properly interpreted as evidence of the accumulation of fluid.

Pituitary—The clinical diagnosis of "pituitary obesity" is very commonly made, although there is no such entity. Ever since the description of Frohlich's syndrome in 1901 it has been popularly believed that a pituitary tumour or the destruction of pituitary tissue by the tumour gives rise to obesity. This gained favour when Cushing¹⁶ supported this claim and reported that partial extirpation of the pituitary in dogs gives rise to obesity. This claim, however, has been proved to be incorrect,

for, as will soon be seen, in such cases the obesity is due not to removal of pituitary tissue but to the simultaneous injury of the hypothalamus. In the true Frohlich's syndrome, too, obesity is apparently due to injury of the hypothalamus.

Furthermore, it has been an unfortunate practice to refer to every case of obesity and hypogonadism in children as Frohlich's syndrome, or pituitary obesity, even though a pituitary tumour is never found. Actually, except for the obesity, these are perfectly normal children who grow up to be perfectly normal adults. Such boys are usually erroneously referred to as hypogonadal as the penis appears small only because it is embedded in a considerable amount of supra-pubic fat, when one retracts the supra-pubic tissue the penis appears normal in size.

On the other hand destruction of the pituitary results not in obesity but, on the contrary, in cachexia. The picture of Simmonds's disease with the marked emaciation is well known and this condition is the result of destruction of anterior pituitary tissue.

In Cushing's syndrome there is a plethoric obesity confined chiefly to the head and trunk. This is in many cases due to a lipophilic adenoma of the pituitary. In many there is no pituitary tumour. In some there is a tumour of the adrenal cortex. Actually there is no marked obesity in the true Cushing's syndrome and the appearance of a large chest and abdomen is deceptive and is mainly the result of narrowing or collapsing of the vertebrae and a relaxation of the abdominal muscles.¹⁷⁻¹⁸

Hypothalamus.—Philip Smith¹⁹ was the first to demonstrate that in its careful removal of the pituitary does not cause obesity whereas injury to the hypothalamus does result in such. He explained that in the dog hypophysectomy does give rise to obesity because of the unavoidable injury to the hypothalamus during the operation. Hetherington and Ranson^{20, 21} have recently shown in the rat that firstly simple hypophysectomy does not produce obesity and secondly that even denervation of the pituitary by cutting the nervous pathways to it or section of the pituitary stalk is without effect on the production of obesity as long as no hypothalamic injury is involved. On the other hand large symmetrically placed lesions of the hypothalamus produce obesity in all the rats. They deduce that the presence of the pituitary is not essential to the appearance of hypothalamic obesity and that the response seems to be caused by the severance of the pathways which descend from the hypothalamus. Recent work on dogs by Hembecker and White²² and by Hembecker, White and Rolf²³ demonstrated that hypothalamic obesity is due to bilateral injury of the posterior hypothalamus which causes retrograde degeneration of the cells of the paraventricular nuclei. The cell loss of most significance in causing obesity

is from the caudal portion of these nuclei and must be bilateral. The maximum degree of obesity results when the entire paraventricular nucleus disappears, partial loss results in only moderate obesity. These workers also claim that obesity develops more rapidly when the supraoptico-hypophyseal system innervating the pituitary-forming tissue of the pituitary is totally or nearly totally inactivated, that is, when total or near total diabetes insipidus exists.

C. N. H. Long and his associates^{24, 25} studied the metabolism in hypothalamic obesity. They placed bilateral, symmetrical lesions in the hypothalamus of rats. Almost immediately after the operation these animals began to eat voraciously, often two to three times as much food as eaten by their littermates, and soon became very obese. Ten rats with operation were pair-fed with their controls; they frequently ate their day's ration in less than two hours but did not gain any more weight than their controls. The oxygen consumption in the surgical animals was found to be normal. The authors therefore regard the development of obesity in these animals as a consequence of increased appetite and not the result of any fundamental metabolic disturbance.

TREATMENT

Diets.—Limitation of diet is still the principal way to obtain an effective reduction of weight. All diets devised to reduce weight are founded upon an attempt to compel the body to utilize its own fat for supplying part of the energy it requires. The average normal person requires daily an amount of energy equivalent to about 2500 calories of heat. This energy is normally supplied by the food we eat. Therefore if we reduce the total calorie intake below the energy requirements, the fat stored in the body will be called upon to make up the deficiency. The body fat becomes transformed into a utilizable form which supplies energy during muscular work. Hence the body weight is gradually reduced. The essential feature of a reducing diet is therefore a restriction of its total number of calories.

Studies by Bloek²⁶ in Newburgh's laboratory indicate that obese persons release fat from fat stores as a source of energy as readily as normal people. This is in direct contradiction of Hetherington's theory of "lipophila" whereby he postulates that in the obese person the fat from fatty tissue is not as easily available as a source of energy as in the normal. In fact, Bloek's studies suggest that it is likely that the obese release the fat from fatty tissue more readily than the normal, since they usually lose less nitrogen than the normal when they are underfed. Furthermore, in the obese the respiratory quotient, both in the fasting state and after a meal is lower than in controls, that is, they metabolize more fat.

Diets of widely different caloric values have been recommended by various authorities. In very fat persons Folm and Denis²⁷ instituted a series of fasts of about five days each with interim diets of insufficient caloric value. They were guided in the length of each fast by the ammonia and the acetone eliminated in the urine. They found this method effective, rapid, and safe. However, such a procedure is impractical and its safety is questionable. Newburgh,⁷ as well as Evans,¹⁰ use small diets consisting of about 400 to 600 calories daily, and claim very successful results. The fear that patients on such small diets will not maintain nitrogen balance has been dispelled by the work of Strang and McCluggage,⁹ who showed that when obese persons subsisted on 450 calories daily they were always in nitrogen balance when the diet contained 60 gm of protein. However, such diets are probably also impractical for ambulatory patients, though they may be very good for hospitalized cases, especially those who require a rapid reduction of weight, such as obese persons in cardiac failure. For the average ambulatory obese patient who is pursuing his usual occupation the most practical diets appear to be those containing 1,000 to 1,200 calories daily. He will be less uncomfortable, and he will not rebel as readily as against the more restricted diet.

It is of the utmost importance that in causing a loss of weight one should avoid causing also a loss of body protein. It has been found that the inclusion in the diet of 1 gm protein per kgm body weight will keep the patient in nitrogen equilibrium. By accomplishing this one will avoid a lowering of the body resistance, a feeling of fatigue and exhaustion, and a lowering of the blood pressure. Even a higher protein intake may be desirable, as 1½ gm per kgm body weight. Protein requires 1 to 2 hours of gastric digestion and therefore slows the emptying time of the stomach. In this way, an increased protein intake may eliminate or reduce the sharp hunger pains which frequently occur 1 to 2 hours after meals in patients on a restricted diet. Furthermore, in such cases the sensations of hunger and fatigue are often due to a mild hypoglycæmia and a high protein intake tends to prevent this lowering of the blood sugar. Thorn and his associates²⁸ have recently shown that in normal people an increase in protein intake decreases fatigue in the late morning and afternoon by preventing the drop in blood sugar that tends to occur at these periods. The same principle is also applied in the treatment of hyperinsulinism with a high protein diet. Protein also has the highest specific dynamic action and it is claimed that in such a way a high-protein intake will enhance loss of weight. Campbell²⁹ reports very favourable results with diets of a caloric value of about 20% below basal requirements and containing

2 gm protein per kgm body weight. Finally it should be remembered that it is necessary to make up the protein allowance from foods of high biological value.

The remainder of the calories are made up from carbohydrate and fat. The carbohydrate of the food is converted to body fat, and therefore, strictly speaking, it should make little difference whether the carbohydrate or fat element of the diet is more greatly diminished. Some authors allow a liberal amount of fat though most claim that the carbohydrate foods are more satisfying. Furthermore, most patients stand a limitation of fat better than that of carbohydrate. It should also be remembered that a minimal supply of carbohydrate equal to 2/3 to 3/4 gm for each gram of protein is necessary to maintain the patient in nitrogen equilibrium despite an intake of 1 gm protein per kgm of ideal weight.

One must also supply the essential minerals and vitamins. Skimmed milk, in addition to being a good source of protein, provides calcium and phosphorus. Fruits and green vegetables are good bulk as well as a good source of vitamins B and C. However, the low fat diet is probably deficient in vitamins A and D. In general, it is a good practice to administer one or two multivitamin tablets daily.

Exercise—Exercise does increase the energy output but at the same time it stimulates the appetite. Therefore if one does not restrict the dietary intake simultaneously, the additional food eaten will cancel the increased expenditure of energy and there will not occur any caloric deficit to result in a loss of body fat. Furthermore, one can more easily attain a certain caloric restriction through limitation of diet than a similar energy loss through exercise. Newburgh⁷ has calculated that a man weighing 250 lb can climb a flight of stairs 10 feet high at the expense of but 3 calories but by depriving himself of 1/3 gm butter or 1/4 teaspoon sugar he will reduce his intake 3 calories. He will have to climb 20 flights of stairs to rid himself of the energy contained in one slice of bread. If he is a good walker he may dissipate 100 calories per mile. Omission of 1 oz cream will reduce the intake by the same caloric value.

Wilder and co-workers³⁰ report two cases who lost more weight on a restricted diet while resting in bed than when up and around. They feel that these patients were close to circulatory failure, and that rest caused the loss of non-pitting edema.

Physiotherapy—This does not remove any fat. Through massage and other passive exercise the masseur will lose energy and weight, but not the patient. It will only tone up his flabby muscles. Sweating procedures reduce weight by the removal of water only, furthermore, this weight will be regained in 2 or 3

days as a result of increased thirst causing increased fluid intake

Thyroid—From previous considerations regarding energy metabolism in obesity and the small number of obese people who manifest a low BMR it would appear that thyroid should not be administered to the majority of obese patients. However, what is not realized is that many patients who initially have a normal BMR will, after some time on a reduced calorie intake, develop a lower and lower BMR. Undernutrition will reduce basal metabolism,³¹ thus holds good to a large degree for obese persons as well as normal though to a greater extent in the latter. As a result of mass observations on the effect of low caloric rations during the first World War Benedict and his associates² carried out experiments with a group of normal young individuals whose body weights were lowered as a result of a reduction in their diets. In a group of 12 subjects the daily caloric intake was reduced to 1,400 calories for a period of 3 weeks during which time there was an average weight loss of only 6.5%. Most of the subjects noted a sensation of cold and a marked reduction in perspiration. The average basal pulse was reduced from 56 to 40 per minute with several instances of pulse rates of 29 to 35 per minute. There was a 25% reduction in basal metabolism during the three-week period. These observations have been confirmed by many and indeed Master and his associates³² have taken advantage of these principles to treat cases of coronary thrombosis by a low-calorie diet in order to produce a low BMR. In guinea-pigs Stephens³⁴ even noted that a low-calorie diet causing a loss of from 20 to 30% of body weight in a period of two weeks, resulted in marked anatomic changes in the thyroid there was atrophy and flattening of the acinar epithelium and retention of colloid, suggesting a resting, inactive gland.

A similar, though less marked lowering of the basal metabolism can be observed in obese persons who have been on a reduced calorie intake for several weeks. In such cases further reduction of weight on a restricted diet alone may be very slow, while the addition of thyroid medication will accelerate the weight loss. This will be of great value in the therapy of many obese cases who have already been on a reducing diet for some time.

Furthermore, during the administration of thyroid medication to such cases, as well as to persons of normal weight with a somewhat low BMR, certain principles must be observed. In general, an endocrine gland may be set at rest and even caused to undergo atrophy by the administration of the hormone secreted by that gland.³⁵ In 1920 Leo Loeb³⁶ showed that the feeding of thyroid tablets to guinea-pigs had a marked inhibitory effect on the compensatory hypertrophy of remnants of thyroid

tissue left after partial thyroidectomy. Recently Farquharson and Squires³⁷ showed that when thyroid is administered to a non-myxoedematous patient that is one with some intact thyroid tissue, the BMR after the initial rise begins to drop in a few weeks and eventually reaches a level lower than the original, but when the thyroid dosage is increased the BMR rises again. Therefore, in administering thyroid over a prolonged period of time the dosage has to be increased from time to time. This is particularly applicable in the treatment of obesity, for here the BMR is disposed to drop still more after the patient is on a prolonged low calorie diet. Hence thyroid has a place in the treatment of the obese person who initially has a normal BMR if applied on the basis of these physiological principles.

Dinitrophenol—Only a few years ago this drug was received very enthusiastically by the medical profession for the treatment of obesity. But many cases of toxic reactions and even a few fatalities have occurred. The result is that most clinics have abandoned the drug entirely.

Benzcdrine—Recently some³⁸ have used this drug in reduction therapy on the principle that it diminishes the person's appetite. However, the dosage required for this purpose is quite high and many undesirable reactions are likely to occur.

Diuretics—It should first be stated that although many still recommend restriction of water in the treatment of obesity, most authorities feel that this should not be done and that the patient may take as much water as he pleases provided, of course, that he does not take too much sodium chloride. In addition to restriction of fluids some use diuretics. These will definitely cause diuresis and a reduction of weight. However this weight loss is usually very temporary and will be regained in 2 to 4 days as a result of increased fluid intake. This applies particularly to powerful diuretics, as the mercurials. The diuresis may also result in an excessive loss of sodium and chloride and the patient may feel quite weak and tired and complain of dizziness, and perhaps even of muscle pain. Milder diuretics, such as ammonium chloride, given in smaller doses and over a prolonged period of time may produce a satisfactory loss of weight without any undesirable symptoms.

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CLINICAL and LABORATORY NOTES

A MEDICAL GRADING CODE

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Toronto, Ont

In several years of army use, the PULHEMS code system for grading recruits and following soldiers medically was found so valuable for giving a concise overall impression of a man's fitness for duty, that it seemed likely that a similar system would prove worth while in civilian practice and especially in grading men and women for industry. It was felt, however, that for civilian purposes, the code letters PULHEMS were insufficient to give a complete medical picture of the average civilian, especially if disabled by illness.

After considerable thought, bearing in mind the need for a word easily pronounced and spelled, and with letters whose interpretation could easily be remembered, the code word PACKINGHOUSE LTD (pronounced "packing-house limited") was chosen, the literal meaning having, of course, no significance. This word contains all the letters of the original

PULHEMS system, in their original meanings, except the letter "M" for mental level, which was combined with the letter "N" for neurological system, in this new word. Naturally, since a good many of the younger doctors are familiar with the PULHEMS system through their experience on active service, this fact will make the new word all the more easily understood.

The individual letters of this code are interpreted as follows:

- P — (Physique), the individual's general physique, constitutional condition, his state as a physical, mental, and emotional unit
- A — (Arterial), the heart and circulatory system
- C — (Chest), the whole respiratory system
- K — (Kidney), the urinary and genital tracts
- I — (Intestine), the gastro-intestinal tract
- N — (Neurological), the neurological system, including the mental level, but not emotional stability
- G — (Glands), all glands, both those of internal and external secretion, including the gonads
- H — (Hearing), the ears and hearing
- O — (Blood), the lymphatic and hæmopoietic systems
- U — (Upper), upper limbs and upper back
- S — (Stability), emotional stability
- E — (Eyes), eyes and vision
- L — (Lower), lower limbs and lower back
- T — (Teeth)
- D — (Dermatology), the skin, hair and nails

It is suggested that five grades be assigned to each letter on the basis of function. These could be set arbitrarily as follows:

Grade 1 Obviously fit for any and all activities, eyesight and hearing perfect, emotional stability normal, etc.

Grade 2 Fit for most activities, with slight limitations.

Grade 3 Fit for sedentary occupations only, or those permitting definite defects in vision, hearing, emotional stability, etc.

Grade 4 Only capable of very light work, permitting serious defects in vision, hearing, etc.

Grade 5 Incapable of any work at all.

Using this system, workers could be medically graded for industry in the same way that the army classified men for various forms of army activity. Thus a man in good health with imperfect eyesight, partially corrected by glasses, would be graded thus:

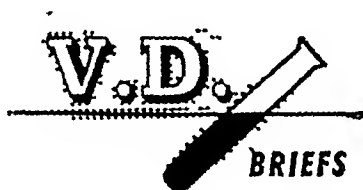
YOB PACKINGHOUSE LTD
1917 1 1 1 1 1 1 1 1 1 1 3 1 1 1

YOB would refer to the year of his birth, and E-3 to eyes and vision grade 3. An employer, seeing this rating on the man's certificate, would know that he could be employed on any type of job not requiring first-class eyesight.

Probably the system could be used by the individual doctor too, as a means of summing up briefly the condition of each patient and as a means of following patients from year to year. Correspondence on this subject will be welcomed by the authors.

8 Riverside Trail

VENEREAL DISEASE CAMPAIGN



Moral and Social Controls Needed in Anti-V D Fight

It is an axiom in public health that to prevent the spread of communicable disease the contact of infected with non-infected persons must be prevented. This is true in the case of tuberculosis, of diphtheria and of smallpox.

"It is also true of Venereal Disease in spite of the fact that some highly trained medical leaders would have us believe that Venereal Disease is in a completely different category because sex is involved," writes Dr. Gordon Bates in an article "Sex education is not enough" in a recent issue of the magazine *Health*, official publication of the Health League of Canada.

Dr. Bates intimated it was evident in this connection that some public health authorities considered that questions of morals were none of their business.

"These quasi experts fail to observe in their pronouncements that no normal woman with a decent education wants to be a prostitute or to be promiscuous," writes Dr. Bates. "It is equally true that no young man who has a proper conception of the history of advancing civilization and its connection with romantic love wants to be promiscuous if a normal marriage is possible for him at a normal age—or indeed, wants to be promiscuous at all. In Anglo-Saxon countries the great Victorian authors and poets, Thackeray, Scott, Dickens, Browning, Wordsworth and Tennyson, have taught him this lesson.

"Such lessons are not learned by observing test tube reactions or peering through a microscope—but they must be learned before the scourge of Venereal Disease can be controlled. In the long run it is possible that Robert Browning and Sidney and Beatrice Webb will play as great or a greater part in the

control of Venereal Disease than Elihu and Wassermann.

"It has been unfashionable to discuss Venereal Disease in terms of morality, yet without morality in the true sense affecting both conduct and social conditions, Venereal Disease cannot be controlled."

Dr. Bates thinks any thoughtful person must recognize the fact that the Venereal Diseases arise from abnormal relationship outside of marriage and that these arise from factors influencing conduct.

"Yet it is obvious that many people who ought to know better have taken the view that mere education as to the facts of Venereal Disease and the provisions of facilities for diagnosis and treatment are sufficient to control Venereal Disease."

Dr. Bates reviews reports which indicate that in North America Venereal Diseases are on the increase—"in the face of a widespread educational campaign as to the facts of Venereal Disease and the most rapid improvement in methods of treatment in the history of the world."

V D Statistics

Over a thousand more cases of venereal disease were reported in Canada in the second quarter of this year than in the same period in 1945, according to a statement by the Hon. Dr. J. J. McCann, acting minister of National Health and Welfare.

"Although the most recent reports show a decline in new cases, venereal diseases continue among the top ranking problems facing Canada today," Dr. McCann said. "Venereal disease can be eradicated. This year the federal government has set aside over \$270,000 to combat the V D menace, but legislation, money and medical skill are not enough. To eliminate this scourge requires an enlightened community and wholehearted co-operation, not only on the health front but equally on the moral, welfare and legal sectors."

In the first six months of this year 21,933 cases of syphilis and gonorrhoea were reported. Of these 8,283 were syphilis and the remainder gonorrhoea.

The total number of cases in the April-June quarter was 10,235 as against 11,698 in the first three months of the year. For the April-June period of 1945 the total of new cases of all types of V D was 9,188.

The rate of syphilis for Canada has fallen from 147 per 100,000 population during the first quarter of 1946 to 125 per 100,000 in the April-June period. The rate of gonorrhoea per 100,000 has declined 11%, from 236.8 to 210.8 per 100,000 population.

"Find V D Contacts — Report V D Cases"

THE CANADIAN MEDICAL ASSOCIATION

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EDITORIAL

WHAT IS THE REAL INCIDENCE OF POLIOMYELITIS?

BEGINNING in July, and running on into the autumn, the incidence of poliomyelitis in many parts of eastern Canada has reached epidemic proportions. The numbers of reported cases are noted in the daily press and followed with anxious interest by worried parents. Do these figures represent the actual incidence of the disease, or are many cases overlooked and unrecorded?

The diagnosis of poliomyelitis presents peculiar difficulties. Specific virus tests are so complicated and expensive that few laboratories are equipped to undertake them, and consequently they can seldom be applied. Recognition must be based on the history, the clinical findings, and the course. Not uncommonly it rests on a balance of probabilities rather than on scientific certainty. Encephalitis of various types and other infections of the central nervous system sometimes give similar signs, and can only with difficulty be excluded. An acute illness in a child or young adult, with moderate fever, some resistance of the neck to forward flexion, more or less stiffness of the back, and a positive Kernig sign in one or both legs, is strongly suggestive. If demonstrable paralysis shortly follows, and/or an increase of cells and proteins in the spinal fluid can be found, there is little room for doubt. Statistics grounded on these criteria are accurate as far as they go, but do the available statistics include all the cases?

What of the many febrile disorders of varying severity which seem to be so rife during an epidemic? They have few distinctive signs, essentially negative laboratory findings, and promptly recover without obvious sequelæ. That many of them are mild or abortive cases of poliomyelitis is commonly accepted. Others are minor infections of different etiology, such as influenza, upper respiratory conditions, gastrointestinal disturbances. It is impossible in

practice to differentiate with any degree of accuracy this confusing group. If all are considered to be poliomyelitis, the resulting figures would be too high. If all doubtful cases are excluded, as is now the tendency, the numbers reported are almost certainly much too low. The apparent mortality rate of about 4.5% is consequently too high, and the same criticism applies to the figures sometimes given for those likely to suffer from permanent disabilities.

The incidence of definitely diagnosed cases in an outbreak rarely goes as high as 1 in 2,000 of the population at risk, and is often considerably lower. Even if most of the concurrent minor infections are included, the total is not strikingly large. Several possible explanations for this relatively low attack rate may be advanced. Poliomyelitis is perhaps naturally not very communicable, or certain uncommon factors may be necessary for its transmission, or most people may have an adequate degree of tissue immunity, inborn or acquired. There is evidence, based on limited surveys, that a very high percentage of city people have specific antibodies in their blood. According to accepted theories this, as in other virus diseases, is most likely due to previous attack or exposure. The incidence of poliomyelitis is therefore probably considerably higher than statistics would indicate, but it has not been possible to even estimate the number of cases that really occur. Careful observation of large but relatively controllable groups during an epidemic might yield approximations of some value.

As the undiagnosed cases probably roughly parallel those with recognizable signs, reported figures give a fairly accurate measure of the prevalence of poliomyelitis in a community, rather than its actual incidence. By what factor they should be multiplied to give the true total is a problem still unsolved.

RCS



EDITORIAL COMMENTS

Immunization with BCG

The search for a direct remedy in the treatment of tuberculosis continues. No specific has yet been discovered, neither antibiotic nor chemical, although streptomycin has raised expectation. Protective or immunizing methods are also constantly being tried. Of these the Calmette-Guérin bacillus vaccine has been the longest in the field and probably has had the widest trial. BCG was used first in France more than 20 years ago, and was first administered by mouth to infants. Later, subcutaneous injection was employed. The production of tuberculin sensitiveness by vaccine is definitely proved, but it is not so easy to show how much protection against tuberculosis is produced by this type of vaccination, nor how long it lasts. From the very beginning statisticians have questioned the accuracy or weight of conclusions made from its use in various groups. The observed difference in mortality were not always great enough to be more than fortuitous; the vaccinated children were not a random sample representative of the same population as those taken as controls, such factors as medical or home care, frequency of inspection, etc. were extremely difficult to assess. One epidemiologist felt that the use or neglect of this method of treatment would depend on psychological considerations.

The opposition therefore to the use of BCG seems to have been largely of the passive kind. It does not seem to have brought enough conviction of its value to cause its universal adoption. It has been given its most extended trials in Europe, particularly Central Europe and Norway, and it is in the latter country perhaps that the most extensive and carefully controlled observations on its use have been made. In Canada, perhaps the largest group of children to be vaccinated with BCG has been in Montreal under the direction of Dr Boudouin, with indications of the reduction of tuberculosis in the third, fourth and fifth years of life. On the other hand the conclusion reached in New York City in a recent series was that as a public health measure BCG is less advantageous than the removal from the home of children of the tuberculous subject.

We believe that there is now a movement to introduce it in Great Britain, and consideration is being given to the production in that country of the necessary supply of vaccine. The precautions to be used in the manufacture of the vaccine are so stringent that centralization of its production under proper control would seem to be a necessity, for it is recognized that considerable variations in the virulence of the vaccine occur, enough to seriously impair its value on the one hand, or to cause local effects

which if not serious may be a grave difficulty in the extensive use of the vaccine.

This method of vaccination has been shown to be free of danger, but apparently it will require several years of carefully controlled observation before it can be regarded as an indispensable part of the anti-tuberculosis program.

MEN and BOOKS

TREPANATION AMONG THE EARLY INDIANS OF BRITISH COLUMBIA

By G. E. Kidd, M.D.

Vancouver

Trepanning and trephining are not altogether synonymous terms. The former is derived from a Greek word meaning an auger, and refers to the making of a surgical opening in the living skull by any instrument whatsoever. Trephining refers to the more recent method of opening a skull by the removal of a disk of bone by a crown saw.

Trepanning of skulls during the neolithic age was fairly widespread among the peoples of the world. It is generally assumed that it was introduced into America from Siberia. This theory has been substantiated by the finding of a trepanned skull on Kodiak Island off the coast of Alaska. On this continent, during pre-Columbian times and possibly later, it was most commonly practised in Peru and Bolivia where trepanned skulls have been found in great numbers. A few have been discovered in Mexico, but to the north of that country it is rare. The late Dr Hrdlicka, of the Smithsonian Institution in a review published in 1939 could cite only half a dozen cases from the United States. These came from widely scattered points, Georgia, Michigan and New Mexico. The same report refers to three specimens of trepanning as having been found in Canada, all on the Pacific Coast. Of these two came from Boundary Bay, south of Vancouver, and were described by the late Harlan Smith of the National Museum at Ottawa. The third was found in 1930 at the mouth of the Fraser River. It is skull No. 1 among the specimens exhibited here today. More recently skulls Nos. 2 and 3 have been found, both in British Columbia. So far as I know, no other cases of aboriginal trepanning have been found in Canada.

While all three skulls antedate the coming of the white man, No. 1 is the only specimen the age of which can be estimated with any degree of accuracy. It was found by excavation

* Read at the Seventy-seventh Annual Meeting of the Canadian Medical Association, Section of Historical Medicine, Banff, Alberta, June 12, 1946.

tois working for the Vancouver City Museum, in the great Eburne shell mound at the mouth of the Fraser River. On the surface of the mound a 450 year old tree had grown, while the lower layers of shells from which the midden was built must have been placed there at a very much earlier date.

The skull is that of a young adult male, probably in his early twenties. It is unique in having been what is known as a copper burial, a ceremony reserved for persons of high rank. The forehead and chest were covered by thinly beaten out sheets of native copper.

In the centre of the occipital region there is a circular opening some 24 mm in diameter, which shows evidence of cicatrization and must have been made during life. The opening is saucer-shaped, the outer table of the skull having been denuded over an area double the size of the fenestrum in the inner table.



Fig 1

A second smaller cup shaped excavation is to be seen about two inches to the right of the first, and over the lower end of the parieto-occipital suture line. It is 18 mm in its longest diameter. In depth it barely reaches through the inner table of the skull. Here there is no evidence of healing. The diploe are open and the edges of the wound are sharply defined, while scratches made by a cutting instrument are still to be seen on the walls. The operator either ran into difficulties, or his patient died while he was still at work.

Skull No 2 is the property of Dr Robertson Jr of Vancouver. It was recently discovered on the West Coast of Vancouver Island in the

mining district of Zabellos. It was thrown up by a bulldozer making excavations. The conditions under which it was found are not known so that the approximate age of the specimen can in no way be determined. It is an oblong skull of a middle-aged male. In this case also the opening is located in the region of the external occipital protuberance, and is in every way similar to the larger opening in skull No 1, except that it is larger, being 42 mm in its longest diameter. The operative area shows evidence of healing, so that the patient must have lived for some time subsequent to his trepanation.

Skull No 3 is that of an elderly person and was found recently in one of the numerous shell heaps of the Boundary Bay area. It was dug up about twenty yards from high tide. It is not a case of true trepanation, but rather that of a denudation of the outer table over a wide area. The depression is oval shaped and is 50 mm in its longest diameter. What therapeutic effect was hoped for by this operation is not known. Hrdheka describes a similar case of a Peruvian skull where the outer table was extensively removed from the frontal area, with no disturbance of the inner table. It is possible that our specimen may have been an interrupted attempt at complete trepanation. The location of the operative area is identical with openings in the other two skulls: the upper mid-occipital area. It shows evidence of healing.

It will be noted that all three specimens have several things in common. (1) The openings, except for the smaller one in skull No 1, are located in the same area, the upper central occipital. (2) In each case the same technique was used in performing the operation, and similar instruments were used. (3) In each case—again excepting skull No 1—the patient survived long enough for healing to take place.

These facts may indicate, either that all three operations were performed by the same person, or that all operators followed the same technique, and that the teaching of the art of trepanation along the Coast was uniform.

The sites of operation in these specimens are not such as would be chosen by a neuro surgeon of today. They are dangerously close to the large blood sinuses in this area, but the operator must have proceeded with great skill and care when cutting through the inner table leaving the dura intact.

The reasons for trepanation in these cases can only be guessed at. A long-time missionary among the Coast Indians of B.C., told me of being approached by a chief, carrying a brace and bit, who begged him to bore a hole in his skull to allow the escape of an evil spirit which was causing him to have headaches. Hidheka assumed that it was done to relieve such conditions as epilepsy, convulsions, insanity, and headache, all of which were attributed to

demons enclosed within the cranium. Many Peruvians, however, were done to relieve from depressed fractures caused by war clubs. These last were true surgical procedures. Even our own cases may be regarded as surgical procedures in that the operation was done to permit the escape from the body of some malign influence which was supposedly causing distressing symptoms. The Indian was probably sincere in his reasons for trepanning a skull, although such reasoning was limited by his knowledge of pathological conditions.

The method of operation and the nature of the instrument used varied. In cases of depressed fracture the Peruvians used a flint saw by means of which a rectangular window was

cut in the skull wall and the fragments of bone removed. In other cases a circular trench was made by a flint chisel and the encircled disk pried out. In each of the cases shown here, the method of making the opening was by scraping, the instrument used being a sharp spoon-shaped piece of flint. From the pericranium to the dura the bone was carefully scraped away a little at a time. This was a tedious but eminently safe procedure.

ARTHRITIS AMONG THE EARLY INDIANS OF BRITISH COLUMBIA

Arthritis is one of the earliest and most widespread diseases from which mankind has suffered, and the early Indians who lived on the damp slopes of the North Pacific Coast had their share of it. A very high percentage of the skeletal remains taken from the various



Fig 2

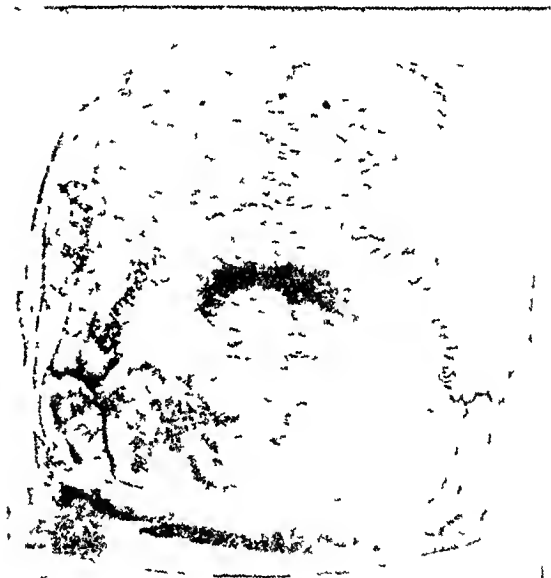


Fig 3

cut in the skull wall and the fragments of bone removed. In other cases a circular trench was made by a flint chisel and the encircled disk pried out. In each of the cases shown here, the method of making the opening was by scraping, the instrument used being a sharp spoon-shaped piece of flint. From the pericranium to the dura the bone was carefully scraped away a little at a time. This was a tedious but eminently safe procedure.

It would seem almost impossible that a human being could have borne the prolonged pain and shock of an operation such as this. It is quite probable, however, that these native surgeons had a knowledge of certain plant juices which would produce a local anaesthesia. This was the case farther south where the leaves of the coca plant from which cocaine is made are known to have been used for that purpose.

These primitive surgeons also knew how to dress a wound. I think you will agree with me that in view of the specimens shown here

shell mounds of British Columbia shows evidence of the disease. It is prevalent in the various joints of the extremities but the vertebral column seems to have been the most common site of attack. I have the skull of an aged individual taken from an elaborate earthen grave in the Harrison Lake area, some 75 miles inland from the coast. Attached to it are the first five cervical vertebrae, which are solidly fused each with the others, and with the base of the skull. Pathologists have diagnosed the condition as resulting from rheumatoid arthritis.

The taking of steam baths in bark tents was a common practice among the Indians when the white man first came, the steam being generated by throwing water on hot stones. Authorities suggest that this was a therapeutic measure for the treatment of arthritis.

ARTIFICIAL DEFORMATION OF THE SKULL AMONG THE INDIANS OF BRITISH COLUMBIA

We have several specimens showing intentional deformation of the skull by artificial means. Four of them are wedge shaped, a result of pressure applied directly from front to back. The other is what is known as a sugar loaf skull, in which the deformity is produced by a tight bandage being placed about the occiput, which causes an elongation of the posterior part of the skull.

Artificial deformation of the skull was a common practice among certain tribes of the Pacific North West, down to recent times. About the middle of the last century an Eastern Canadian artist, Paul Kane, visited the Coast and has left us both drawings and detailed written accounts of the technique of deformation, which was in common usage at the time. In the case of the wedge shaped

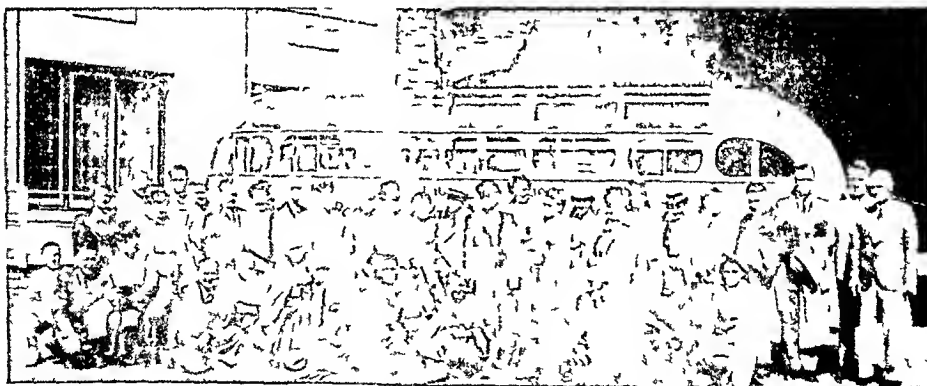
skulls the infant was, immediately after birth, placed on its cradle board, and the head was firmly fixed by a strap of woven cedar bark which passed across the forehead. The area of counter pressure on the occiput was well padded. Pressure was continued for eight months, after which time the deformation was permanent. Only for a few days after the pressure was first applied would the child cry, later it seemed to get used to it. Again when the head band was finally removed there would be acute discomfort for a time.

A deformed skull, amongst the Indians, was a badge of good family and pure blood. No slave was allowed to deform the head of his child. Persons who have known these individuals during life assure us that there was no lessening of the intelligence as a result of this artificial deformation.

925 W Georgia St

ASSOCIATION NOTES

We reproduce herewith as a pleasant reminder a group photograph of the Canadian Association of Radiologists taken at the meeting at Banff in June. We are enabled to do this by the kindness of the Canadian Industries Limited.



In this group photograph, taken at Banff Springs Hotel, are
Back row (left to right) Mrs. Guillaume Gill, Montreal, Dr. D. G. Florendine, Calgary, Mrs. S. M. Rose, Lethbridge, Dr. J. J. Porter and Mrs. Porter, Calgary, Dr. R. C. Burr and Mrs. Burr, Kingston, Dr. C. M. Henry and Mrs. Henry, Victoria, Dr. A. E. Blacket and Mrs. Blacket, New Glasgow, N.S., Dr. Ethlyn Trapp, Dr. H. H. Cheney, Dr. Margaret Hardie, and Mrs. H. H. Cheney, all of Vancouver, Mrs. J. Lloyd Brown and Mrs. Allyn Blair of Regina, Mrs. W. H. McGuffin, Calgary, Mrs. W. A. Whitelaw, Mrs. B. J. Harrison and Mrs. Bruce McEwen, all of Vancouver, Mr. E. Dale Trout, Chicago, Dr. A. E. Childe, Winnipeg, Dr. N. E. Dunn, Edmonton, and Dr. W. A. Whitelaw, Vancouver.
Front row (left to right) Dr. E. W. Spencer, Saskatoon, Dr. Ivan Smith and Mrs. Smith, London, Dr. S. M. Rose, Lethbridge, Dr. Guillaume Gill, Montreal, Dr. W. H. McGuffin, Calgary, Dr. Jules Gossehn, Quebec City, Mr. Percy Ghent, Toronto, Mr. Bert Merrin, Winnipeg, Mrs. E. W. Spencer, Saskatoon, (name not ascertained), Dr. C. W. Proulx, Vancouver, Dr. R. Proctor, Edmonton and Dr. Christina A. Fraser, Vancouver.

MEDICAL SOCIETIES

Prince Edward Island Medical Society

At Summerside on the evening of August 23, a most enjoyable dinner and educational program was held in Epworth Hall.

The Medical Educational Committee under the chairmanship of Dr J C Houston is to be congratulated for their splendid activities during the past year.

Monthly dinners have been in order at which the doctors, their wives and friends, have gathered not only to do justice to the sumptuous repasts provided, but also to make new acquaintances and renew old friendships. It provides a splendid opportunity for the newer members of the Society to become acquainted with the older members.

The educational program was interesting and well presented. Participating were Dr Claude Holland, Halifax, who spoke on the "Diagnosis, complications and treatment of diabetes", and Dr Cyril Kenley, Halifax, who for some years has been in charge of the Polio Clinic, in Halifax, and a strong advocate of the Kenny method of treatment. Dr Kenley gave a most timely and forceful talk on "Infantile paralysis", illustrating the signs and pathology in a case recently recovered from the acute phase of the disease. He gave in detail the method of treatment which he had found most beneficial during the years he had supervised the clinic.

Visitors present included Dr Ray Brow, Dr Fied McKiv of Montreal, Dr H A Ansley of Ottawa and Dr Pearl Hopgood of Dartmouth, N.S.

Canadian Tuberculosis Association

The 46th annual meeting of the Canadian Tuberculosis Association was held in Calgary at the Pailser Hotel on September 9, 10 and 11. About forty members from eastern and western Canada were in attendance. At the annual dinner meeting, Dr A H Baker, Superintendent of the Central Alberta Sanatorium, was installed as president, succeeding Dr J D Adamson, of Winnipeg, in this office. Dr G T Wherrett, of Ottawa, was re-elected executive secretary.

Following executive meetings and the meeting of the advisory committee on Indian tuberculosis during the first day, the program absorbed most of the second and third days. There was a general session on Tuberculosis Control in Canada under theegis of the Department of National Health and Welfare, the Department of Veterans' Affairs and the Canadian Pension Commission. Of seven resolutions adopted by this Association, four had to do with prevention of the tuberculosis scourge. Recommendations are to be forwarded to the proper federal departments, that chest x-rays are to be taken of well discharged ex-servicemen, (2) all European war brides, (3) every patient admitted to hospital, and (4) all immigrants either prior to leaving or before arriving at a Canadian port. Another resolution asked that this Association "urge that adequate grants for the prevention and control of tuberculosis be made available by the Federal Government to the various provinces, and so enable all provinces to develop fully effective tuberculosis programs. The need of such Federal assistance is urgent."

A feature of the program was on mass surveys which included BCG vaccination by Dr R G Ferguson, rehabilitation by Dr T A J Cummings and records and statistics by Dr G J Wherrett.

On the last day of the meeting, the members wore the guests of Dr A H Baker at the Central Alberta Sanatorium and two clinical sessions were held. Drs L L Ross and J Orr discussed a "Study of minimal lesions", Dr A C Sinclair "Selective thoracoplasty" and Dr A R Armstrong, "New laboratory procedures."

Dr A H Baker's subject was "Alberta's tuberculosis program". Dr R G Huckell discussed "Tuberculosis of the spine", and Dr G H Hames "Tuberculosis of the trachea and major bronchi".

During the afternoon the members and their wives enjoyed a garden party at the Sanatorium, which was under the direction of Miss Kathleen Connors, Superintendent of Nurses and her staff.

La Société de Chirurgie de Montreal

Seance de la Societe de Chirurgie de Montreal le 4 septembre 1946

1 OSTÉOMYÉLITE AIGUE VS SULFAMIDÉS ET PENICILLINE —J C Favreau

Jusqu'à l'avènement des sulfamides, l'ostéomyélite était considérée comme une maladie grave dans ses conséquences locales et générales. La mortalité atteignait 30%. Le traitement de cette maladie était aride. Le chirurgien drainait les abcès, trepanait, curettait, resquait, appliquait des larves de la vase line, etc. Médicalement, on a employé le serum de convalescents, les immuno transfusions, les vaccins, les baeteriophages, le propidon, le carbone intraveineux, l'aurothérapie, le mercurochrome intraveineux, etc.

Les sulfamides sont venus et ont marqué le point de départ d'une ère nouvelle avec un chirurgement important dans le traitement et les conséquences de cette terrible affection. La mortalité est devenue presque nulle, les jours d'hospitalisation ont considérablement diminué, la guérison locale a été obtenue en un temps relativement très court.

A son tour la pénicilline est venue et l'on a vu nos statistiques s'améliorer encore de façon insoupçonnée.

A l'appui de ces affirmations, trois tableaux comparatifs ont été préparés. Le tableau no 1 résume les observations de 10 cas d'ostéomyélite traités à l'Hôpital Sainte Justine avant l'ère des sulfamides: la mortalité a été de 20%, la moyenne des jours d'hospitalisation a été de 254, la moyenne du temps de guérison a été de 26 mois. Le tableau no 2 résume les observations de 10 cas d'ostéomyélite traités avec l'aide des sulfamides: la mortalité a été nulle, la moyenne du temps de guérison a été de 77 mois. Le tableau no 3 résume les observations de 10 cas d'ostéomyélite traités avec l'aide des sulfamides et de la pénicilline: la mortalité a été nulle, la moyenne des jours d'hospitalisation a été de 33 jours, la moyenne du temps de guérison a été de 3 mois.

Ce travail a été préparé dans le but de répondre de façon précise à cette question que nous posent souvent les médecins qui n'ont pas l'habitude de traiter un grand nombre de cas d'ostéomyélite aiguë. Notre rôle d'orthopédiste dans le grand hôpital pour les enfants malades nous a permis de présenter cet expose bien insuffisant.

2 RUPTURES SPONTANÉES DE L'UTÉRUS —Lucien Julien

La gravité des ruptures spontanées de l'utérus dont la symptomatologie peut varier à l'extrême, fut le début de ce travail. Cette affection est relativement fréquente puisqu'elle peut aller de 1 pour 95 à 1 pour 6,000, et grave parce que responsable 40 à 60% de mortalité chez la femme qui en est atteinte.

La rupture est plus fréquente chez les multipares et surtout chez celles qui ont déjà eu des césariennes, ou quelque intervention quo ce soit sur l'utérus. Le rapporteur cependant présente un cas de rupture utérine chez une primipare à terme, âgée de 33 ans, où les symptômes de choc et d'hémorragie interne étaient réduits au minimum et qui n'avait eu pour toute intervention sur l'utérus qu'un curetage un an auparavant. Guérison après hystérectomie subtotale. Il décrit les ruptures complètes et incomplètes et le mécanisme du placenta prévia fréquent dans ces cas parce que décolle de la paroi de l'utérus.

Le choc, l'hémorragie ou l'infection sont ordinairement la cause de la mort chez ces patientes

Difficile à confondre avec une autre complication, la rupture spontanée peut cependant passer inaperçue, mais une fois le diagnostic fait, le traitement en est la laparotomie pour suture de la déchirure ou hystérectomie subtotale selon les cas. Le pronostic sérieux de cette affection exige donc un diagnostic précoce et une intervention urgente dans le plus grand intérêt de la mère et de l'enfant

3 TRAITEMENT DU COXA VARA —A. Samson

L'auteur présente six cas de coxa vara qu'il traite par une ostéotomie sous trochantérienne. Les fragments ont été maintenus en position de correction à l'aide de plusieurs clous de Steinman. Dans deux cas, il a fallu faire un allongement des muscles péroniers

ANTONIO SAMSON, M.D.

Secrétaire

UNIVERSITY NOTES

Registration of medical students in Canada as reported so far for this year is as follows

University of Alberta in all years, 179 First year 45, second year 37, third year 14, fourth year 32, fifth year 21 (graduating October 5, 1946)

Dalhousie University in all years, 219 First year 59, second year 32, third year 44, fourth year 36, fifth year 28

McGill University in all years, 402 First year 116, including 72 ex service

Queen's University in all years, 257 First year 61, second year 56, third year 51, fourth year 48, sixth year 41

University of Toronto in all years, 912 First pre medical year 138 ex service and 58 civilian, first year medicine 143 ex service and 21 civilian

CANADIAN MEDICAL WAR SERVICES

MEDICAL OFFICERS STRUCK OFF STRENGTH OF THE R. C. A. M. C.—ACTIVE FORCE

AUGUST, 1946

(Previous sections in January, March, April, May, June, July, September, October, November, and December, 1945 and January, March, May, June, July, August, September and October, 1946)

SECTION LXXXII

Name	Address	Date struck off strength	Name	Address	Date struck off strength
Aber, S.	3787 Vendome Ave, Montreal	26 6 46	Cippe, B. E.	114 Beatrice St, Toronto	23 7 46
Adams, M. B.	1208 Main St, East, Hamilton, Ont	10 7 46	Carson, J. H.	Mountain Senatorium, Hamilton, Ont	9 7 46
Adey, A. B.	605 Rathgar Ave, Winnipeg	9 7 46	Cave, H. A.	Winthrop Chemical Co, Dominion Square Bldg, Montreal	12 7 46
Alcorn, D. E.	804 Doreen Place, Victoria	11 7 46	Cham, M.	151 Alfred Ave, Winnipeg	12 7 46
Allen, M.	1265 Hart St, Three Rivers	31 5 46	Champagne, J.	1422 Notre Dame St W, Montreal	24 7 46
Alleyn, G. G.	13 Fraser St, Quebec	31 5 46	Charman, J. H.	52 Walnut St, Halifax	21 5 46
Atkinson, H. S.	Box 1190, Portage La Prairie, Man	27 6 46	Chartier, J.	26 Bourdages St, St Hyacinthe, Que	17 7 46
Austin, W. E.	Hazelton, B.C.	16 7 46	Chepesuk, M. W.	313 Collingwood St, Kingston, Ont	5 7 46
Babineau, G.	La Tuque, Que	18 6 46	Cholod, S.	Hafford, Sask	12 7 46
Balfour, G. S.	3027 4th St, S.W., Calgary	24 6 46	Clarke, W. T. W.	409 Walmer Road, Toronto	22 7 46
Barber, G. S.	35 Charlotte St, Brantford, Ont	25 7 46	Claveau, R.	29 Begin Ave, Chicoutimi, Que	14 6 46
Barends, H. A.	168 Bayswater Ave, Ottawa	11 7 46	Cluff, J. W.	625 West 12th Ave, Vancouver	4 7 46
Barnett, H. J. M.	62 Brooklyn Ave, Toronto	10 7 46	Cohen, B. H.	6 Rutherford Ave, Hamilton, Ont	10 7 46
Basmajian, J. V.	41 Lappin Ave, Toronto	24 7 46	Cole, J. D. C.	273 Poplar Plains Rd, Toronto	11 7 46
Battista, A. F.	9 Whitehead Ave, Cornwall, Ont	25 6 46	Colpitts, G. E.	849 Lipton St, Winnipeg	12 7 46
Bean, J. L. M.	H.M.C.S. Cornwallis, Halifax, N.S.	9 7 46	Copoland, G. G.	825 Richmond St, London, Ont	5 7 46
Bearisto, A. W.	15 Oriole Parkway, Toronto	24 5 46	Corrigan, V. A.	290 Johnson St, Kingston, Ont	8 7 46
Beaudin, A. D.	St George de Beauce, Que	9 7 46	Cosgrove, J. B. R.	Tilton, Man	28 6 46
Beaudoin, L. P.	44 St Genevieve St, Que	1 7 46	Cowley, T. C.	220 Powell Ave, Ottawa	9 7 46
Beaule, A.	359 Arago St, Que	20 6 46	Croome, R. R. M.	124 Church St, Sault Ste Marie, Ont	27 6 46
Belanger, R.	Kedgwick, N.B.	8 7 46	Davies, A. J. M.	City Hospital, Saskatoon	11 6 46
Bell, D. M.	13417 102nd Ave, Edmonton	29 5 46	Davis, M. M.	Box 186, Truro, N.S.	13 6 46
Bellamy, R. P.	Lumsden, Sask	19 6 46	Debly, J. P.	125 Jubilee Rd, Halifax	19 7 46
Bell Irving, P.	3044 Roseberry St W, Vancouver	23 7 46	D'Eon, B.	50 St Louis St, Quebec	6 7 46
Berger, B.	Box 727, Estevan, Sask	5 7 46	de St Victor, J.	940 St Valer St, Quebec	13 7 46
Berkeley, J. A.	Box 87, St Catharines, Ont	9 7 46	Dodge, W. A.	412 Brunswick Ave, Toronto	9 7 46
Best, S. C.	50 Prince Arthur Ave, Toronto	9 7 46	Dolan, R. J.	South Nelson, N.B.	17 6 46
Bourgoin, L. P. J.	271 McDougall Ave, Outremont, Que	17 7 46	Dubeau, J. A. M.	Hospital St Justine, Montreal	9 7 46
Brown, E. M.	111 Albert Ave, Saskatoon	28 6 46	Dunn, D. H.	R.R. 5, Cookstown, Ont	17 7 46
Buell, A. L.	223 West 13th Ave, Vancouver	5 7 46	Dunn, N. E.	Vermilion, Alberta	10 6 46
Butcher, J. J.	53 Fairleigh Ave S, Hamilton, Ont	10 7 46	Dunsworth, F. A.	168 Barrington St, Halifax	10 7 46
Caddwell, G. G.	94 Lorne Crescent, Brantford, Ont	27 6 46	Duprat, G.	Gravelburg, Sask	27 6 46
Campbell, D. B.	23 Algonquin Ave, Toronto	29 5 46	Dupre, G. H.	26 Hebert St, Quebec	3 7 46
Campbell, D. E. M.	Trenton, Ont	8 7 46			

Name	Address	Date struck off strength	Name	Address	Date struck off strength
Edwards, K N,	118 Crescent Road, Transeona, Man	4 7 46	Lavallee, L,	180 St John St, Quebec	11 7 46
Ferrier, R A,	253 Balmoral St, Winnipeg	13 7 46	Laverone, P H,	5365 Decelles St, Montreal	3 7 46
Finley, J A,	7 Grunge St, Saint John, NB	1 6 46	Lavers, H D,	Parrsboro, NS	8 6 46
Firstbrook, J B,	2 Donchiffe Place, Toronto	2 7 46	Lavoie, R,	514 St Cyrille St, Quebec	10 7 46
Fitch, R H,	26 Weldon St, Moncton, NB	9 7 46	Leahey, D R,	2993 West 44th St, Vancouver	4 6 46
Fitzgerald, M F,	559 Victoria Rd, Sydney, NS	19 7 46	Leclerc, G,	121 Chapel St, Ottawa	16 7 46
Forther, J,	L'Enfant Jesus Hospital, Quebec	12 7 46	Lehmann, E C H,	Apt 301, 1118 Elgin Terrace, Peel St, Montreal	21 6 46
Forsgard, R N,	Marigold P O, Victoria	3 7 46	Letienne, R,	686 College St, St Boniface, Man	19 7 46
Fraser, K A,	Whycocomagh, Inverness County, NS	6 6 46	Lewis, D F,	40 Chena Ave, Toronto	29 6 46
Fraser, M M,	Walters Falls, Ont	11 7 46	Lewis, G A,	238 Glenview Ave, Toronto	5 7 46
Gauthier, P,	12 Laporte St, Quebec	11 7 46	Littner, N,	Toronto	4 7 46
Geleff, T,	45 Nasmith Ave, Toronto	24 7 46	Lobley, P G,	48 Pine Crest Road, Toronto	6 7 46
Gemmell, J P,	Assinibois, Sask	20 6 46	Loeb, H H,	289 Wilbrod St, Ottawa	13 5 46
Gendron, J B,	Weyburn, Sask	29 6 46	Longmore, A J,	Apt 203, 89 Bredalbane St, Toronto	25 7 46
Gerrard, R,	466 St Simon St, St Hyacinthe, Que	27 6 46	Lucas, G R J,	337 North Archibald St, Fort Wilham, Ont	11 7 46
Giroux, M L Y,	14 Green St, St Lambert, Que	22 7 46	MacBeth, R A L,	10328 121st St, Edmonton	9 7 46
Golding, T A S,	1603 Maple Ave, Pullman, Washington, USA	23 7 46	McCormick, R W,	Harrow, Ont	9 7 46
Goldstein, A V,	181 Markham St, Toronto	3 7 46	MacDonald, A R S,	Coldale, Alta	10 6 46
Gordon, C A,	Campbellton, NB	8 6 46	MacDonald, F B,	341 King Edward St, Glace Bay, NS	5 6 46
Gorvoy, J D,	173 Beatrice St, Toronto	9 7 46	McPadden, R L,	1782 Assiniboine Ave, Winnipeg	26 6 46
Goudreau, R,	83 St Georges St, Levis, Que	13 5 46	McIntosh, J D,	302 South Syndicate Ave, Fort Wilham, Ont	10 7 46
Graham, W L,	918 Centre St, Whitby, Ont	28 6 46	McKenzie, A D,	Kelowna B C	2 7 46
Grant, D K,	Suite 10, Willingdon Apts, Winnipeg	22 6 46	MacKenzie, D J,	Apt 203, 89 Breadalbane St, Toronto	16 7 46
Gray, A G,	120 Oak St, Winnipeg	2 7 46	McKenzie, J G,	Box 235, Prince George, B C	28 6 46
Green, N,	32 George St, Peterborough, Ont	28 6 46	MacKenzie, R G,	S Louise St, Truro, NS	20 6 46
Grieve, J D,	Address not known	10 7 46	MacKenzie, S G,	18 Hampstead Court, Truro, NS	28 6 46
Grignon, G E,	St Jovite, Que	12 7 46	MacKinnon, A M,	34 Delhi St, Guelph, Ont	17 7 46
Grise, E A,	c/o Mrs D Nolan, Brantford, Ont	5 7 46	MacKinnon, K J C,	Antigonish, NS	11 7 46
Hahn, C E,	36 Strath Ave, Toronto	5 7 46	MacIntosh, C N,	62 Hawthorne St, Dartmouth, NS	5 7 46
Halfhide, R,	1385 Bernard Ave, Apt 20, Montreal	8 7 46	MacLenn, A D,	67 Middlegate St, Winnipeg	17 6 46
Hardie, P W,	Mountain Sanatorium, Hamilton, Ont	18 7 46	McMullen, D G,	RR 5, Trenton, Ont	8 7 46
Hazen, F C,	Newcastle, NB	4 7 46	McQuaig, K D,	Finch, Ont	18 7 46
Hawks, G H,	168 Lytton Blvd, Toronto	5 7 46	MacTavish, J E,	Suite 6, Royal York Apts, Winnipeg	15 7 46
Hay, A J S,	General delivery, Stettler, Alta	11 6 46	Maloney, J H,	Barachois, Gaspe County, Que	22 7 46
Hebert, J G,	4203 Rue Ste Catherine, East, Montreal	15 7 46	Mann, I W,	146 South Mitton St, Sarnia, Ont	30 7 46
Heller, E M,	154 Chiltern Hill Rd, Toronto	9 7 46	Marehand, P,	St Trite, Champlain County, Que	14 6 46
Hellman, K,	Paradise Hill, Sask	19 6 46	Marshall, N,	Taber, Alta	2 7 46
Henderson, M H,	203 Lauder Ave, Toronto	3 7 46	Mercado, A L,	St Justine Hospital, Montreal	12 7 46
Heninger, M K,	Raymond, Alta	11 7 46	Merritt, J O,	8 Nelles Blvd, Grimsby, Ont	9 7 46
Heron, J S,	22 York Ave, Mount Dennis, Ont	15 7 46	Miller, D,	718 Granville St, Vancouver	21 6 46
Herscovitch, O,	4202 Van Horne Ave, Montreal	19 7 46	Miskelly, L M,	Rosetown, Sask	3 7 46
Holden, C P,	176 St John St, Fredericton, NB	16 7 46	Moir, J B,	644 Banatyne Ave, Winnipeg	25 6 46
Holmes, R B,	1015 Wellington St, London, Ont	9 7 46	Moore, J A,	Smooth Rock Falls, Ont	11 7 46
Hotz, H,	105 Cannon St E, Hamilton, Ont	8 7 46	Morrison, J K,	St Peter's, Richmond County, NS	29 6 46
Hunt, D W,	336 Maplewood Ave, Winnipeg	5 7 46	Morse, W I,	Paradise, Annapolis County, NS	29 6 46
Jacques, M,	12 Laporte St, Quebec	25 6 46	Mosser, H A,	Ilderton, Ont	25 6 46
James, M M,	209 University Ave, Kingston, Ont	2 7 46	Murray, G M,	213 Union St, Sydney, NS	13 7 46
Janowsky, S,	776 St Patricks St, Victoria	8 7 46	Murray, I M,	Box 140, Stellarton NS	29 6 46
Jenkins, G E,	Ontario Hospital, New Toronto, Ont	28 6 46	Murray, W B,	Morley, Alta	11 6 46
Johnston, M W,	Eston, Sask	10 7 46	Myers, E D,	1332 Dundas St W, Toronto	16 7 46
Junek, V D,	Esterhazy, Sask	11 7 46	Nancikvill, H K,	569 Concession St, Hamilton, Ont	11 7 46
Karlinsky, W,	423 Dufferin Ave, Winnipeg	15 7 46	Newell, J E,	Box 513, Portage La Prairie, Man	24 6 46
Keenly, R F,	Toronto Hospital for Consumptives, Weston, Ont	17 7 46	Nicholson, G M,	827 King St E, Hamilton, Ont	25 7 46
King, D M,	1855 West 43rd Ave, Vancouver	10 7 46	O'Donnell, W J,	Bathurst, NB	28 6 46
Kinley, G J,	92 Oxford St, Halifax	21 6 46	Orr, W J,	2128 Culp St, Niagara Falls, Ont	4 7 46
Kobernick, S D,	1428 Mansfield St, Montreal	18 7 46	Ostrander A B,	1037 Dorehester Ave, Winnipeg	10 6 46
Kucherepa, J W,	268 High Park Ave, Toronto	24 7 46	Ovorn, H,	4380 Harvard Ave, Montreal	2 7 46
Lamb, E R,	118 Broad St West, Dunnville, Ont	4 7 46	Palneke, T G,	390 Princess Ave, London, Ont	30 6 46
Lamont, W H,	183 Oakdean Blvd, Winnipeg	17 6 46	Paradis, B,	50 St Louis St, Quebec City	11 7 46
Lander, H A,	438 St John's Ave, Winnipeg	26 6 46	Parker, G N,	31 Plavter Crescent, Toronto	28 6 46
Langis, L R,	20 Peel St, Sherbrooke, Que	11 7 46	Parrott, F C,	Midland, Ont	3 7 46
Lapierre, A P,	524 Windermere Ave, Toronto	5 7 46			

Name	Address	Date struck off strength	Name	Address	Date struck off strength
Pearman, R W,	1471 Chomedy St, Apt 5, Montreal	2 7 46	Solmes, J G R,	36 Colborne St E, Oshawa, Ont	11 7 46
Pelletier, G J L,	34 Blandford St, Toronto	4 7 46	Spencer, S H,	430 Palmerston Blvd, Toronto	17 7 46
Perry, A W,	2507 Avebury St, Victoria	19 7 46	Sproule, H F,	1200 Weston Road, Mount Dennis, Ont	25 7 46
Pierce, M K,	354 Stella Ave, Winnipeg	17 7 46	Standish, C T,	3183 West 5th Ave, Vancouver	12 7 46
Pitcher, H V,	153 Pinnacle Ave, Belleville, Ont	13 7 46	Stanley, R A,	Vancouver, B C	27 4 46
Pratt, M C,	c/o Mrs W A Irish, 755 Wellington Crescent, Winnipeg	3 7 46	Stevenson, H C,	Belmont, Man	12 7 46
Prueter, G W,	122 Allen St West, Waterloo, Ont	12 7 46	Strickland, S C,	850 East River Road, New Glasgow, N S	13 6 46
Raymond, G H,	5681 Terrebonne St, N D G, Montreal	24 6 46	Surehn, H H,	636 Belmont Ave, Westmount, Que	8 7 46
Ragg, L I,	Dunnville, Ont	5 7 46	Sussman, A H,	Arthur, Ont	4 7 46
Robertson, C M,	Nelson, B C	13 5 46	Tannenbaum, I,	5303 Esplanade Ave, Montreal	8 7 46
Robitaille, J C,	51 1/2 Rue St Anselme, Que	5 7 46	Tardif, G,	46 Couillard St, Quebec	11 7 46
Rochon, M J G,	677 Fleury St, Montreal	22 7 46	Taylor, C L,	36 Edgewood Crescent, Toronto	11 7 46
Rock, E D,	100 Wellington St, Kingston, Ont	28 5 46	Teleford, D,	2956 Point Grey Rd, Vancouver	27 6 46
Ross, W D,	3655 St Famille St, Montreal	16 7 46	Tessier, P E,	La Perade, Champlain County, Que	29 6 46
Rotenburg, C,	334 Rushton Road, Toronto	4 7 46	Tremblay, A,	20 Bagot St, Bagotville, Que	2 7 46
Roulston, T J,	2113 Smith St, Regina	12 7 46	Trichman, B,	211 Beverley St, Toronto	4 7 46
Rousseau, J,	123 Grande Allee, Quebec	6 7 46	Therrien, R,	39 Genevieve Ave, Quebec	8 7 46
Ruddick, R B,	1491 Crescent St, Montreal	10 7 46	Tremblay, B M,	Lachute Mills, Que	18 7 46
Ruble, J D,	Wilkie, Sask	29 6 46	Turner, A S,	8619 108A, Edmonton	18 6 46
Russell, W F,	Coombs, B C	5 7 46	Tylhurst, J S,	799 Lankless Ave, Victoria	19 6 46
Sabourin, G A,	St Jean Baptiste, Man	18 7 46	Walker, W E,	Penticton, B C	31 5 46
Schwartz, B,	Ashern, Man	5 7 46	Watson, E E B,	Apt 1, 1 Benlamond Ave, Toronto	28 6 46
Scott, C I,	Orangeville, Ont	27 6 46	Weaver, K S,	3701 Dewdney Ave, Regina	10 7 46
Scott, G O,	211 Melrose St, Ottawa	30 5 46	Weinberg, F,	175 Grace St, Toronto	4 7 46
Sereda, M M,	1125 91st Ave, Edmonton	18 6 46	Weinlos, C W H,	11219 100th Ave, Edmonton	18 6 46
Seymour, B A,	Haleybury, Ont	6 7 46	Whish, L E,	139 Albany Ave, Toronto	18 6 46
Shapiro, B J,	1622 Lajoie St, Outremont, Que	8 7 46	Wiggin, N J B,	123 King Street East, Kingston, Ont	10 7 46
Sheer, W T,	Suite 5, Clayton Apts, Winnipeg	25 7 46	Williams, C T,	324 Somerset St W, Ottawa	24 7 46
Sherman, A I,	28 Cannon St W, Hamilton, Ont	3 7 46	Wilson, J C S,	Port Colborne, Ont	11 7 46
Shuman, B,	Ottawa Civic Hospital, Ottawa	19 6 46	Wilson, W W,	McNamee, N B	20 6 46
Silverman, S B,	5265 Cote St Luc Road, Montreal	20 6 46	Winter, B,	47 Barton Ave, Toronto	2 7 46
Simard, F X,	St Joseph D'Alma, Lac St Jean, Que	4 7 46	Wolfe, A D,	108 Havard Ave, Winnipeg	15 6 46
Slater, H M,	6 Connaught Circle, Toronto	2 7 46	Wolff, R G,	General Delivery, Cardston, Alta	20 7 46
Smith, E J,	Shediac, N B	26 7 46	Wong, W A,	518 Waterloo St, London, Ont	11 7 46
Smith, V W,	29 Beech Drive, Victoria	5 6 46	Wright, E R S,	4391 Harvard Ave, N D G, Montreal	19 7 46
			Zad, V M,	225 Prince Edward St, Saint John N B	12 7 46

SECTION LXXXIII

Died in Canada *Date of death*
 Groff, H K, 11131 88th Ave, Edmonton 24 8 46

CORRESPONDENCE

Irresistible Impulse and Crime

To the Editor

I have read with great interest the article and letters in your *Journal* by W C J Meredith, K C, M A, and Dr G H Stevenson, dealing with the question of "Irresistible impulse and crime." Mr Meredith's article in the April issue appeared to me to be rather contradictory. In the first part he seemed to rather favour the admission of the "irresistible impulse" as a legal excuse for crime, whereas in the latter part he quoted apparently with approval Judge Raddell of Ontario and Chief Justice Gibson of Pennsylvania as opposing this suggestion. In his letter in June, Mr Meredith was of the opinion that only by admitting the validity of the "irresistible impulse" could any improvement be made in the present status of mental illness as an excuse for crime in Canada.

May I be permitted to point out that the State of Massachusetts has been able to approach this whole question in a more scientific manner. The operation of the Briggs Law in Massachusetts is fully described

by Prof F E Haynes, Professor of Sociology, State University of Iowa in his textbook on "Criminology." The Briggs Law was as follows:

"Whenever a person is indicted by a grand jury for a capital offense, or whenever a person, who is known to have been indicted for any other offense more than once, or to have been previously convicted of a felony, is indicted by a grand jury or bound over for trial in a superior court, notice shall be given to the Department of Mental Diseases and the department shall cause such person to be examined with a view to determine his mental condition and the existence of any mental disease or defect which would affect his criminal responsibility. The department is required to file its report with the clerk of the court in which the trial is to be held and the report is to be accessible to the court, the district attorney and to the attorney for the accused and is admissible as evidence of the mental condition of the accused."

The examination is made before trial and before it is decided whether or not to resort to the defense of insanity. During the years 1921 to 1933, 3,610 persons were examined and 610 cases or 16.9% of all cases examined were found to have some evidences of mental

deviation, leaving 83.1% who were mentally normal. There is no limitation upon the right to introduce other mental experts but since the law has been in operation the practice has become almost non-existent. Since the costs of jury sessions of courts are estimated at \$500.00 a day, not including the fees of expert witnesses, the expense of many costly trials. Since the Briggs Law was passed there has been an average of less than one case a year in which chemists have been employed by the defense in trials. The National Crime Commission in June, 1928 stated

"Obviously, what steps to take depend upon the nature of individual the court is dealing with. The psychiatrist, with his special knowledge of certain types of criminal behaviour, comes in to assist the court in gaining an understanding of the prisoner, of his intellectual constitution, his emotional make-up, character and personality traits, educational and social background and other important mental and physical factors bearing upon the case. It is the criminal and not the crime that must be dealt with."

I have personal knowledge of case 2 mentioned by Dr. Stephenson in his clear and comprehensive report. This Indian is a low grade mental defective, a type that should have been easily evident at the time of his trial—and is now under constant observation in a psychiatric ward. If this man is discharged from the penitentiary, he will be transferred to a mental hospital for further care. Several other cases of prisoners under psychiatric observation were undoubtedly psychotic when sentenced and if Canada had had a Briggs Law, they would have been transferred to a hospital for treatment instead of being sent to a penitentiary. Their care is a very serious problem to the department of mental health authorities.

Mr. Meredith appears to be of the opinion that the right to trial by jury is a fundamental principle of our constitution and to substitute a board of experts for the jury would establish a dangerous precedent. Like Dr. Stephenson, I have frequently observed the "deliberations" of juries on the question of insanity and I have yet to see one jury which had the common sense or the intelligence to adjudicate such a difficult question.

C. M. CRANFORD, M.D.

Psychiatrist's Office,
Kingston Penitentiary,
Kingston, Ont.

Latin in Prescription Writing

To the Editor

The usage of Latin in prescription writing is a relic of a medical nomenclature the very last, and shabby, remnant of a bygone time in which science was truly international. It is the remnant of a time when the universities were truly *Universitates Literarum* based on the medieval conception of the Latin schools in which the *artes liberales* were taught, the philosophical background being humanism and the conception that European culture was a continuation and evolution of the Hellenic Empire and Christian universality. This conception seems to have given way to thoroughly materialistic thinking emancipated from tradition. Our universities have become highly specialized, overspecialized, training schools for artisans, the teaching of the humanities has been largely abandoned in our secondary schools and is being scoffed at as just so much unnecessary ballast.

We just as well may face the facts, and throw Latin out in prescription writing, it is illogical and insincere to bother our students with Latin abbreviations and terms, as they are entirely lacking the prerequisites to understand those Latin words. Under the present circumstances to use Latin in prescription writing reeks of charlatanism and shammanism, it serves only to impress the patient with a number of letters unintelligible to him and only learned by rote by the doctor. ("Doctor" comes from *Homo doctus* "the well learned man").

The use of the imperial system is a crime against exact science. It is shameful that the Anglo-Saxon

world is clinging to such a thoroughly outmoded and primitive system. Every conceivable effort should be made to eradicate such an utter nuisance. If our young graduates will be taught to use the metric system only, and if this will also be enforced in all teaching hospitals, we may perhaps in the next twenty years be able to get rid of this archaism.

A. F. PERL

SPECIAL CORRESPONDENCE

The London Letter

(From our own correspondent)

THE PUBLIC HEALTH DURING THE WAR

The report of Sir Wilson Jameson, as Chief Medical Officer of the Ministry of Health, "On the State of the Public Health during Six Years of War", is a striking tribute to the skill with which the health services were organized and managed during the years of war. In the face of air raid casualties amounting to 60,854 killed and 86,159 seriously wounded in England and Wales, mass evacuations, threatened food supplies, overtime in factories and the physical and mental strain of black-out conditions, the health of the nation emerged better in 1945 than it was in 1939.

The infant mortality rate (under one year); always considered a reliable criterion of the public health, reached a new low record in 1944 of 45 deaths in every thousand live births. This improvement was not confined to the first year of life but was shown at all ages up to 14 years. Influenza once or twice assumed a threatening aspect, but only the 1918 outbreak was as severe. Cerebro spinal meningitis was more frequent than during the 1914-18 war, but the sulfonamides provided an effective check. Tuberculosis was another problem that at one time assumed serious proportions, partly due to faulty, though possibly unavoidable, administrative measures, but the position eased somewhat during the later years of the war. To the sulfonamides and penicillin must be given the credit for keeping the general diseases problem within reasonable limits.

When it is realized that in London alone more than a million people were sometimes spending the night in air raid shelters, while civilian doctors were reduced to such an extent that the ratio became one doctor to 1,500 people, the medical profession has every reason to be proud of the part it played on the "home front" during the war.

DOCTORS, DENTISTS AND VETERINARY SURGEONS

By a curious coincidence, if coincidence it is, doctors, dentists and veterinary surgeons are all at loggerheads simultaneously with the government over the question of remuneration. Doctors are involved over the question of the capitation fee payable under the National Health Insurance Scheme. When the Spens Committee (previously referred to in this correspondence) was set up the Minister of Health agreed that the findings of the Committee would apply irrespective of the institution of any national health service and would directly bear upon existing conditions in the present National Health Insurance Scheme. This was taken by the profession to be a promise that the recommendations of the Spens Committee would be applied as soon as the committee reported. The committee recommended a capitation fee of 15s, but the Minister has announced that he will only authorize a rise from 10s 6d to 12s 6d.

Convinced that this is a breach of faith, the Insurance Acts Committee has recommended all doctors concerned to place their resignations from the National Health Insurance Service in the hands of the committee and to authorize the committee to submit these mass resignations should the Minister prove intransigent. This is the same procedure as was followed successfully in a similar dispute in 1923.

A similar line of action is being adopted by the dentists as a result of the new scale of fees for dental benefit under the National Health Insurance Act. The Council of the British Dental Association has advised all dentists to refuse all dental benefit letters forthwith, and to tell patients that they will treat them privately at the scale of fees rejected by the Minister of National Insurance.

In the case of the veterinary surgeons, status as well as salary is involved, objection being taken to the new scale of salaries, partly on account of their inadequacy, partly on account of the marked difference between the salaries offered and those paid to the medical profession.

This particular controversy has received sudden publicity from the unusual action of the Minister of Agriculture in declining an invitation to attend the annual dinner of the National Veterinary Medical Association on the grounds that "the deliberate policy adopted by the association to further its aims makes—as it is expressly intended to make—co-operation between the Ministry and the association impossible."

Apart from the merits of the case presented by the three professions, and it is generally agreed that the claims are reasonable, it is unfortunate at this particular time that the government, through three of its Ministers, should give the impression, rightly or wrongly, that professional skill is to be relegated to a position secondary to that of economy.

STREPTOMYCIN

Plans have just been announced for the production in this country of streptomycin. As in the case of penicillin, initial production and clinical trials are to be carried out under the supervision of the Ministry of Supply, the Ministry of Health and the Medical Research Council. Four firms are to co-operate in the pilot plant production and production on this scale is already under way. No streptomycin will be released for general use until full clinical trials have been carried out under the aegis of the Medical Research Council, and in view of the conditions in which streptomycin is said to be of value, such trials will obviously take a considerable time. Meanwhile, however, plans will proceed for large scale production, so that when clinical trials are complete adequate amounts will be available for general use.

ICE CREAM AND ENTERIC FEVER

Two recent outbreaks of enteric fever—one of typhoid involving over 180 cases, and one of paratyphoid involving over 70 cases—have been traced to ice cream vendors who were carriers. That such outbreaks should occur as a result of contaminated ice cream is anything but surprising. As *The Lancet* has pointed out, it is 67 years since it set up a commission which "drew attention to the appallingly filthy conditions in which ice cream was made in the Italian quarter of London." Conditions have certainly improved since then, but they are still far from satisfactory, in spite of action by certain progressive local authorities and by the Ice Cream Association of Great Britain. Indeed, as far back as 1927 this association invited the Minister of Health to prepare a legal definition of ice cream and to enforce the licensing by local authorities of all makers and vendors. This apparently simple and straight forward invitation, however, was ignored, and the best that can be obtained from government quarters is a statement by the Parliamentary Secretary to the Minister of Food that "we told the ice cream trade over a year ago we intended setting up a minimum standard as soon as we could obtain sufficient supplies of the proper ingredients. That time has not yet come" (the italics are your correspondent's). WILLIAM A R THOMSON

London, October, 1946

The Holland Letter

(From our special correspondent)

AN ARTIFICIAL KIDNEY

The Dutch internist Dr E W J Kolff of Kampen, has constructed an apparatus, called the artificial kidney. With the help of this apparatus patients, otherwise dying by uræmic or anuric conditions, may be kept alive.

The patient's blood, liquefied by heparine, is dialysed in the artificial kidney, and urea, creatinine, indoxyl and other toxic products are withdrawn from the blood. The surface of the kidney suitable for the dialysing, is 24,000 cm² and the apparatus is filled completely by only 250 cm³ blood. In 14 hours 120 litres of blood passed through the kidney, and 250 grams of urea were washed out of the passing blood.

If the urea is washed out of his blood, it takes about 6 days before the patient will become uræmic. In these 6 days the patient's own kidneys have the possibility of resuming their function.

Up till now cases of chronic and acute uræmia and of anuria have been treated with the artificial kidney, and often the results were favourable, though definite statistics are not yet available.

The work of Dr W J Kolff was honoured by the University of Groningen, with a doctor's degree *honoris causa* for his book on the artificial kidney.

THE RATIONS IN HOLLAND DURING THE WAR

A table, published by Dr C den Hartog, head of the Information Department of the Institute for Nutrition, shows, that the quantities of food decreased in Holland, as in other countries of Europe, from the beginning till the end of the war. During the last months of the occupation, there was a real famine in Holland, and the Dutch civilian population had to live on rations consisting of only 10 gm of fat, 16 gm of proteins and 112 gm of carbohydrates daily, offering only 618 calories.

		Calories	Proteins in %	Fats in %	Carbo
					hydrates in %
1941	second quarter	1,806	13.0	22.1	64.9
	third "	1,764	12.3	20.0	67.7
	fourth "	1,761	12.0	18.8	69.2
1942	first "	1,780	12.3	19.8	67.9
	second "	1,658	12.6	19.6	67.8
	third "	1,633	12.5	17.7	69.8
	fourth "	1,748	12.0	16.5	71.5
1943	first "	1,740	11.3	16.6	72.1
	second "	1,702	11.8	12.6	75.6
	third "	1,681	11.4	14.4	74.2
	fourth "	1,694	11.1	14.8	73.8
1944	first "	1,602	11.0	14.5	74.5
	second "	1,544	11.7	12.6	75.7
	third "	1,425	11.8	13.7	74.5
	fourth "	1,021	11.6	17.4	71.0
1945	first "	618	10.6	15.1	74.3
	second "	1,396	12.0	26.0	62.0
	third "	2,036	12.2	24.7	63.1
	fourth "	2,178	11.7	20.9	67.4

During the first months of 1946 the official rations, thanks to importations and increased production in the country itself, reached a total of 2,112 calories, consisting of 49 gm fats, 61 proteins and 352 carbohydrates. The food contained during this period 26.0 mgm of vitamin C, 0.98 mgm B₁ and 0.87 mgm B₂. There were 230 International Units vitamin A in the food. Vitamin C and vitamin A D are regularly given to Dutch children.

EXPANSING THE FIRST DUTCH ANTIBIOTICUM

Before the war, van Luyck, a Dutch biologist, made some researches on the influence of *Penicillium expansum* on diseases of plants. Special sorts of *Penicillium expansum* (Link) Thom produced certain antibodies, called mycines. The extract of *Penicillium expansum* inhibited the growth of *Pythium de Barym Hesse* in a dilution of 1:1,280.

In the laboratories of the University of Utrecht *Penicillium expansum* was produced in great quantities under supervision of Professor V J Koningsberger. At the same time, in Amsterdam, Professor B C P Jansen and his staff of the chemical physiological department of the University of Amsterdam, continued their studies about the chemical problems of the antibiotics produced by *Penicillium expansum*.

All this work has been done during the war under the greatest difficulties. The Germans wanted specimens of the extracts, but only non working extracts were given to them.

Expansine, as the crystalline form of *Penicillium expansum* were called, was isolated in February, 1944. It was the first Dutch antibiotic. Dr O Osterhuis and Dr Nauta defined the chemical structure as anhydro 3 oxymethyl 4 pyron carbonacid. Even in a dilution of 1:16,000,000 it had an influence on the growth of *Pythium de Baranyum*.

Expansine appeared to be highly toxic but it was used, applied in ointments, on external bacterial and mycotic diseases, such as eczema, impetigo and ring worm. Expansine inhibits the growth of Gram positive and Gram negative bacteria.

It turned out that in England Professor Raistrick had isolated a product called patulin of *Penicillium patulum* (*Brit M J*, p 915, 1945). Patulin and expansine have the same chemical composition. Researches in Britain on patulin and of expansine in Holland are going on.

GIFTS OF THE AMERICAN RED CROSS

The New York Botanical Gardens made a gift of 20 million units of penicillin to the Dutch Red Cross as an expression of thanks for the tulip bulbs, presented to the New York Botanical Garden by the Dutch Government. The American Red Cross transported the penicillin in the first Dutch airplane "The Flying Dutchman" of the New York Amsterdam line.

Complete surgical outfits for 18 Dutch surgeons were received in Holland as a gift of the American Red Cross.

BOVINE TUBERCULOSIS DURING THE WAR

The chief of the Amsterdam laboratories for public health, Professor Charlotte Ruys, made before and during the war researches on the infection by bovine tuberculosis. Before the war children up to 15 years suffering from tuberculosis of the lungs, were in 9% infected by the bovine type of tuberculosis. In other forms of tuberculosis, e.g., of bones, the bovine type was found in 21%. For adults the same figures are respectively 1 and 20%.

Bovine tuberculosis is especially spread by the consumption of milk. Milk was rationed during the war and the general food situation became worse and worse in the years following 1940. It was found that though tuberculosis infection became more frequent during the war than ever before, the human type of tuberculosis was found in the great majority of cases. Bovine tuberculosis was seldom found a fact due to the rationing of milk and the pasteurization, perfected in the beginning of the war. J Z BARUCH
Amsterdam Z, Holland

During the war years the birth rate for England and Wales rose steadily, reaching 177 in 1944 (the last complete year to which this report relates), its highest point since 1926. The death rate has remained steady, and in 1944 was 127. The principal certified causes of death were in the same order each year—diseases of the heart a long way first, followed by cancer, intra cranial lesions of vascular origin, bronchitis, tuberculosis and diseases of the digestive system—*Brit M J*, September 21, p 432 1946.

ABSTRACTS FROM CURRENT LITERATURE

Medicine

Health Protection in the Production and Use of Atomic Energy. Bale, M F. *Occupational Med*, 2 No 1, July, 1946

This article is of some interest to the medical profession in general in view of the fact that radioactive elements are now being used clinically in some centres and their therapeutic importance promises to become greater in the near future. The author points out that in the production of energy by nuclear reactions radioactive elements are produced and that the amount of radioactivity is directly proportional to the amount of energy generated. Hitherto these reactions have taken place only under closely supervised conditions or else with destructive intent as when the atomic bomb was detonated over Hiroshima. At Hiroshima only 5% of the casualties were the result of radiation sickness; however, those near the site of explosion were killed by detonation, and had a slow reaction involving the production of radioactive elements without detonation occurred, it is conceivable that the casualty list might have been as long, due to radiation deaths alone. And of course, when atomic energy is used for peacetime purposes a slow non explosive reaction will be sought after.

It is not visionary to say that atomic energy has arrived already much research work is being done with radioactive elements in tracer experiments, and of course the workers involved are exposed to radiation, the effects of which are as yet little known. The author points out the need for careful and fundamental research work on this problem. As radioactivity becomes more important both in medicine and as a source of power, this problem will become increasingly more urgent. DOUGLAS FINDLAY

A Study of 219 Cases of Peptic Ulcer in a Series of 2,301 Consecutive Necropsies. Gibbs, J O. *Quart Bull Northwestern University Med School*, 20 3, 1946

This article is based on the findings in 2,301 routine post mortems carried out by the Department of Pathology of Northwestern Medical School between 1921 and 1929. 219 cases of peptic ulcer were found and a statistical analysis of these provides information of much value to the clinician, information which, while not startling, should help to clarify many of the current controversies regarding this disease.

In general, the results tend to confirm the generally accepted views. The rate of incidence of ulcer was 9.55%, the 219 cases comprising 134 cases of gastric ulcer, 100 duodenal lesions, with combined lesions in 17 cases. The age incidence for both types was in the 51 to 60 year group. The author neglects to give the sex incidence. Of interest is the fact that the series comprised 219 cases, of which 186 were pathologically active of these, 38 or 20.5% were correctly diagnosed. However, 128 cases or 58.5% were clinically symptomatic.

The author's findings supports the view that malignant change in peptic ulcer is a relatively rare occurrence. Only 5 cases (2.4%) showed malignant change. Whether these were gastric or duodenal ulcers is not stated. His figures regarding hemorrhage as a cause of death or a contributing factor show that 25 cases or 14% developed this complication. Perforation occurred in 10.5% of the series. DOUGLAS FINDLAY

Acute Pericarditis in Young Adults. Nay, R M. and Bover, N H. *Am Heart J*, 32 222 1946

This is a study of acute pericarditis in 46 young soldiers. In 25 cases rheumatic fever was considered to be the etiological factor in 15 no definite etiology was determined and in the remaining 6 cases, various

etiological factors were present. The clinical differentiation between the first two groups rested upon the co incident joint manifestations and leucocytosis in the rheumatic fever cases, and the abrupt severe onset and absence of leucocytosis in the cases of idiopathic origin. There was no appreciable difference between the two groups in the incidence or amount of pericardial effusion, nor in the electrocardiographic findings. Electrocardiographic abnormalities diagnostic or suggestive of pericarditis were found in 43 of 15 cases. In 29 cases tracings were taken until abnormalities were no longer present, the changes conforming to those usually described as occurring in acute pericarditis. Of interest is the fact that normal electrocardiograms were obtained as long as 2 to 3 weeks after the onset of pericarditis before changes occurred, and in 25 of the 29 cases T wave abnormalities did not occur prior to the 5th day. These findings stress the importance of taking frequent tracings.

The differentiation between the idiopathic group and cases of myocardial infarction rested upon the early presence of a pericardial friction rub in the former together with the aggravation of pain on breathing, swallowing and twisting the trunk, the absence of leucocytosis, and the electrocardiographic findings.

A. L. JOHNSON

Effect of Salicylates on Acute Rheumatic Fever

Warren, H. A., Higley, C. S. and Coombs, F. S. *Am Heart J*, 32, 311, 1946

This study is based on 186 cases of acute rheumatic fever in young adults observed under three different therapeutic regimens. Eighty-eight patients received small doses of sodium salicylate ranging from 2 to 7 gm daily. 50 patients received 10 to 16 gm by mouth. 48 were given 10 gm intravenously for a week and then received the same dosage by mouth as group 1.

The observations of the three methods of treatment on the sedimentation rate were submitted to statistical analysis and it was found that large doses were no more effective than small doses in reducing the rate. With regard to the control of fever, large doses had a significant effect in reducing the temperature, the large oral doses being more effective than the intravenous therapy. Large dose therapy did not reduce the incidence of polycyclic elevations of the sedimentation rate.

Fourteen patients in the entire group developed evidence of organic heart disease or showed increased damage of pre-existing heart disease. This group was divided into 7 cases receiving large dose therapy and 7 cases receiving small dose therapy. These results are based on a relatively short period of observation. There was no significant effect of varying salicylate dosage on the occurrence of a prolonged P-R interval. As regards pericarditis, although the number of cases is small—4 received large doses and 7 received small doses—the authors were impressed with the more favourable response to large dose therapy in this complication.

A. L. JOHNSON

Maternal Rubella as a Cause of Congenital Defects

Parsons, Sir L. G. *Brit Med Bull*, 4, 193, 1946

The reports from Australian workers regarding the apparent etiological relationship between rubella and congenital defects are reviewed. Gregg (1941 and 1944) of Sydney, Australia, collected 206 examples of the association between maternal rubella and congenital defects. The distribution of defects of 130 of these is listed as follows:

Cases	Deaf mutism	Congenital heart disease	Eye defects
85	present		
17	present	present	
5		present	
6			present
8		present	present
8	present	present	present
1	present		present

Swan and co-workers (1943 to 1944) concluded as a result of their investigations in South Australia that "when a woman contracts rubella within the first two months of pregnancy it would appear that the chances of her giving birth to a congenitally defective child are in the region of 100% and if she contracts it in the third month about 50%". The defects found were defects of the eye, heart, deaf mutism and mental retardation. The important periods of development in the organs involved, are in the early period of pregnancy, just at the time when it is stated their mothers contracted rubella. There was often more than one defect and many of the children were under developed and difficult to feed.

The available evidence is considered to support the view that the Australian epidemic was really rubella. That this possible relationship has so recently become apparent is perhaps due to the widespread severe epidemic attacking large numbers of young adults in a population that had enjoyed a long period of freedom from epidemic rubella. There is as yet little data concerning mothers with rubella during pregnancy who gave birth to normal children.

As regards prevention suggestions have been put forward regarding the use of pooled or adult serum, or gamma globulin, or the gamma globulin fraction of rubella convalescent serum. The practical drawback to any plan of prevention is that "the ill effects of rubella are produced, if at all, in the early weeks of pregnancy, and the mother may well be exposed to or even develop the disease before she realizes that she is pregnant."

A. L. JOHNSON

Curative Properties of Rare Earths Found in British Columbia Peloid Deposits

Vancouver Med Ass Bull, 22, 230, 1946

Some years ago a discovery was made on the northern coast line of British Columbia of a large deposit of a mineral clay which on spectroscopic analysis disclosed the presence of "Rare earths". The analysis of this clay is as follows:

Silica	52.52
Alumina	19.40
Ferrous Oxide	4.54
Ferric Oxide	3.75
Titanic Oxide	1.12
Lime	4.33
Magnesia	4.47
Potash	3.80
Soda	1.57
Sulphuric Anhydride	16
Water, Carbonic Anhydride and Organic Matter	4.36
	<hr/> 100.02

The "Rare earths" are a puzzle to analytical chemists inasmuch as each member of the group is a definite element, but all fifteen of them have to occupy the position of one element in the periodic tables being chemically identical. Considerable research work has been done on the effect of these elements on plant growth and it is stated that "one part of these trace elements to two million parts of leu soil often results in a crop of vegetables, rich in vitamins and minerals where formerly they had poor food value". Suspensions of the clay leave a film on glassware which is difficult to remove. Also it is noted that the clay retains its consistency for months in an open container but the moment it is placed in contact with the skin, all the moisture is rapidly absorbed. The clay is able to diminish the growth of *B. Coli* and *Staph. Aureus* by removing food substances required by the bacteria.

The commercial preparation of this clay is known as Absor-Vite and Ray-Vite and is said to be slightly alkaline and to possess a marked buffering action. Its use in 2 cases of lesser curvature gastric ulcer, demonstrated radiologically, led to rapid healing. In a third

case with x-ray findings of a deformed duodenal cap, symptoms were relieved. In a fourth case with ulcer symptoms but no radiological studies, symptoms were said to be quickly relieved.

This medication applied externally is reported to give marked relief in sprains, varicose ulcers, neuritis, and is said to hasten the formation of epithelium over granulating wounds. H E M

Neurofibromatosis Occurring in Three Consecutive Generations Harvey, E *Arch Ophthalm*, 35 700, 1946

Although neurofibroma is a benign tumour, not metastasizing to other organs, its effects can be most disastrous, as was the case with several members of the family here reported. In one member, an eye had to be removed because of the growth of a tumour in the orbit and encircling the optic nerve. In another, the patient died following an operation for removal of the tumours from the occipital fossae. The three generations showing the tumour were the grandfather, whose three sons were normal, the mother, who had two normal sons and the child in the third generation who had a normal brother. There was a history of the great grandmother having numerous tumours over the face, but it is not certain that these were neurofibromata. The usual dominant mode of transmission was followed in this family. MADGE THURLOW MACKLIN

Pedigree of Nystagmus, Myopia and Congenital Eye Defects with Mental Deficiency McGregor, I S *Ann Eugenics*, 13 135, 1946

There were a great many associated eye defects in this family besides the congenital nystagmus, comprising microphthalmos, conjunctival defects, corneal opacity, cataract, abnormal pupil, coloboma of the retina and optic nerve, and optic atrophy. Myopia and feeble mindedness were also present. There were four generations present in the family, no defects are recorded as having been present in the first. By a second marriage a man had 13 children, 4 of whom died in infancy. A daughter (3) and 2 sons (8 and 12) had myopia and nystagmus. A son and 2 other daughters (4, 7 and 9) had nystagmus. Two sons (8 and 14) were mentally unsound. In the third generation, there were 19 children, offspring of Nos 3, 4, 9 and 12. Three died in infancy, 4 had nystagmus, 3 had myopia, 3 had myopia and nystagmus, 3 had multiple eye defects. The fourth generation was composed of 8 children, offspring of two persons with myopia and nystagmus, and one who had nystagmus alone. This fourth generation had one who died in infancy and 4 who had both myopia and nystagmus. The chart does not show any of the normal persons marrying, so that the defective persons were offspring of affected parents. The nystagmus was inherited as a dominant sometimes associated with myopia and sometimes with other eye defects. No person not having nystagmus produced a child with nystagmus. Thus out of 40 persons, 32 grew up far enough to have their defects, if present, detected. Of these 32, 21 had serious eye defects. MADGE THURLOW MACKLIN

Alkali Treatment of Methyl Alcohol Poisoning Chew, W B, Berger, E H, Brines O A and Capron, M J *J Am M Ass*, 130 61, 1946

This report is based on a series of 31 patients suffering from methyl alcohol poisoning. Five died within three hours of admission, and 26 recovered. It is commonly considered that methyl alcohol has a predilection for the retina and optic nerves. It has also been shown that it may cause acute parenchymatous degeneration of the kidneys, liver, heart and other organs. Methyl alcohol is not fully oxidized in the body but is broken down into formic acid and formaldehyde. Formic acid had been found in abnormal amounts eight days after ingestion of the alcohol. The symptoms of intoxication are usually delayed from nine to thirty-six hours. Suddenly headache, nausea and epigastric distress may

appear, associated with dimness of vision. Blindness may follow rapidly with an increase in gravity of the condition. Eighteen of the patients had definite ophthalmoscopic findings in the fundus. This was chiefly congestion of the optic disk and oedema of the disk and the immediate adjacent zone of the retina.

Treatment was directed primarily towards overcoming the acidosis. Alkali was given intravenously in the form of 1/6 molar sodium bicarbonate in isotonic solution of three chlorides. The amount given was guided by repeated plasma bicarbonate determinations in conjunction with clinical indications. In addition sodium bicarbonate was given by mouth or by gavage starting with doses of four gm every fifteen minutes. The total amount of sodium bicarbonate given during the first 24 hours varied from 12 to 100 gm. Whisky was given in one ounce doses every four hours for a day. This is said to promote the displacement of methyl alcohol from its intracellular attachments, and therefore was considered beneficial in the early treatment. The eyes were protected from the light. Improvement of the eye changes under this treatment were particularly gratifying. The response to treatment was prompt in most cases.

There were five deaths. Four of these men were comatose and critically ill on admission. One was conscious but lapsed into coma very shortly. They were all intensely cyanotic and had pronounced respiratory embarrassment. Response to therapy was nil and they died within three hours of admission. Examination of the brains showed evidence of cerebral oedema in the form of widening of the perivascular spaces and loosening of the brain substance generally and swelling of glial cells. There was no evidence of hemorrhage or degeneration necrosis.

The good results obtained, as well as the rationality of this treatment would justify its recommendation.

PRISTON ROBE

Penicillin in the Treatment of Putrid Lung Abscess Steelman, B P and Kree, J *Ann Int Med* 25 66, 1946

The complete recovery of five of their six patients with acute putrid lung abscesses under the combined penicillin and sulfadiazine administration prompts the authors to suggest that this method of treatment deserves serious consideration and further extended trial. This is further emphasized since four of the patients belonged to a group heretofore considered in need of immediate surgical interference, all of whom would probably not have survived the operation.

It is different in the case of the chronic lung abscess. Here the lung and bronchi are converted by the reaction to the putrid infection into a maze of fibrous, multiple, hard walled abscesses, bronchiectasis, atelectasis and chronic pneumonitis, so that restitution to the normal cannot be hoped for with medical care or even with extensive surgery. At times nothing short of lobectomy or pneumonectomy will save the life of the patient. Nevertheless the combined penicillin and sulfadiazine treatment in such cases is of inestimable value. It lessens toxicity, prevents further septic and metastatic foci, clears the surrounding pneumonitis, and improves the general condition of the patient so that he can better withstand the extensive operation indicated to bring relief.

It is important to bear in mind the need of continuing this combined penicillin-sulfadiazine administration in acute putrid lung abscess, not only until all toxic and local symptoms have disappeared but until the chest film shows no abnormal shadows in the segment of lung involved. In chronic putrid abscess the method of care should be started preparatory to surgical intervention and continued after operation until all toxic symptoms disappear. S P TOWSE

Surgery

Cineplastic Forearm Amputations and Prosthesis
Rank, B K and Henderson, G D *Surg, Gyn & Obst*, 83 373, 1946

The reasons for attempting to provide a forearm prosthesis, the types which have been supplied, and their relative value, are described. A concise review of cineplasty, which is an attempt to provide a prosthesis motivated by the muscles in the amputation stump, is followed by a description of its requirements, the plastic operation involved, and the prosthesis. Both are described in detail.

It is emphasized that success can only result from close collaboration between the surgeon and limb maker. A high degree of æsthetic result has been achieved by using acrylic as the basis for the prosthesis and the patients in this group continue to wear them. The value of the procedure depends also on selection of cases.

L T BARCLAY

Mandibular Tumours—A Clinical Roentgenographic and Histopathologic Study Byars, L T and Sarnat, B G *Surg, Gyn & Obst*, 83 355, 1946

"The diagnosis of ameloblastoma (adamantinoma) of the mandible has been made frequently by the use only of the roentgenogram." This is an unsafe practice for the roentgenologic picture is not diagnostic.

Two groups of tumours are described: the first proved ameloblastomas with roentgenological features characteristic of other jaw tumours, the second, a group of multilocular appearance, radiologically, which were proved not to be ameloblastomas.

Twelve cases are detailed including roentgenograms and microphotographs in illustration. They contend that the primary value of the roentgenogram is to demonstrate the site and extent of the lesion in the mandible.

L T BARCLAY

Cancellous Bone Grafts for Infected Bone Defects: A Single Stage Procedure Coleman, H M, Bateman, J H, Dale, G M and Starr, D E *Surg, Gyn & Obst*, 83 392, 1946

The problem of infected compound fractures following war wounds at Christie Street Hospital has been dealt with by applying the methods advocated by Mowler and his colleagues using penicillin intramuscularly, the sequestra and scars are removed, cancellous chips from the crest of the ilium are used to fill the bony defect, and the skin is closed, with skin grafting if necessary.

During the past year 52 such cases have been operated upon, with 92% success. No virulent infections have resulted. In addition, cases in which traumatic osteomyelitis and arthritis were similarly treated by cancellous chips after sequestrectomy, healed and fused successfully. Rapid healing prevents irremediable disuse changes.

Success depends on complete removal of infected tissue, adequate vascular beds for grafts, removal of all cortex from the iliac chips, absence of dead space, penicillin and/or sulfonamides generally and locally, full thickness skin covering, and plaster immobilization. The authors used a powder of 100,000 units of penicillin in 20 grams of sulfathiazole for local dusting.

This procedure is similar to that of the Hill End group in St Alban's, England.

BURNS PLEWES

Intraperitoneal Administration of Succinylsulfathiazole and Phthalylsulfathiazole Young, J P, Jr and Cole, W H *Arch Surg*, 53 182 1946

Innumerable reports indicated that the sulfonamide drugs were effective when used intraperitoneally against peritonitis. Most surgeons abandoned their intraperitoneal use when penicillin was made available, because it appeared to be more effective than the sulfonamide compounds. Penicillin appears definitely to be more helpful against colon bacilli. There would appear to be

a need for an antibiotic agent effective against the *Escherichia coli*. Several writers have shown that when given orally succinylsulfathiazole and phthalylsulfathiazole are capable of reducing the number of bacteria, particularly *Escherichia coli*, in the feces to a remarkably low number. Per gram of drug, phthalylsulfathiazole is about twice as effective as succinylsulfathiazole. The authors experimented on animals injecting separately the latter two drugs into the peritoneal cavities of dogs. They found that 1 gm of succinylsulfathiazole per kilogram of body weight and 1 gm of the phthalylsulfathiazole were tolerated without any evidence of toxic reaction. Up to date, Young and Cole have used these drugs intraperitoneally on fifty-one patients. In 28 patients, succinylsulfathiazole was used and in 23 phthalylsulfathiazole was used in a dose of 6 gm for an adult which is approximately 0.1 gm per kilogram of body weight. The rate of disappearance from the abdominal cavity is much more rapid than either sulfathiazole or sulfadiazine.

Because of the preliminary nature of this report, the authors have not attempted to evaluate the efficacy of succinylsulfathiazole or phthalylsulfathiazole in reducing postoperative peritonitis or other complications.

G D LEARMONTH

Carcinoma of the Stomach Hudson, P B and Alt, R *Am J Surg*, 72 202, 1946

A study of 60 cases of carcinoma of the stomach seen in a small community hospital was undertaken. The clinical impression that symptoms are late in appearing and that few are diagnosed early enough to expect cure by surgery were confirmed. An average of 12.4 weeks were spent on preliminary trials of treatment by alkali, diet, bowel management, etc. The average patient lived only eight months after the initial appearance of symptoms.

The commoner symptoms were, in order of frequency: chronic upper abdominal pain, vomiting, acute abdominal pain, indigestion, anorexia, weight loss, asthenia, hama temesis, vertigo, regurgitation. No macrocytic anemia was seen, the average hemoglobin being 63.7%. X-ray diagnosis increased in accuracy from 85 to 95% between 1917 to 1937 and 1938 to 1945. In several cases the x-ray report was inconclusive till repeated.

Two thirds of the cases were reported primary adenocarcinoma by the pathologist. One case showed concomitant primary carcinoma of the rectum. Three were linitis plastica. Two originated in pre-existing polyps. Only 30% of the cases were apparently free from metastases by gross examination before and during operation. Twenty-five of 60 cases were described as Grade III or IV malignancies.

On these 60 patients, 16 curative operations were attempted, 17 palliative operations were done, and 30% were closed after exploration only. Six patients of the 16 resected survived, a 10% survival rate, (though two of these have not reached the five year postoperative stage).

The authors conclude that present methods are "sadly inadequate" and make a plea for co-ordinated research.

BURNS PLEWES

A propos de 25 cas d'ulcères gastro-duodénaux traités par la splanchnectomie et l'ablation du premier ganglion lombaire Froehlich, F *Presse Méd*, 24 336, 1946

25 cas traités depuis 1942 par la splanchnectomie. Dans l'ensemble les résultats ne sont guère favorables contrôlés par le temps. L'auteur en convient le premier 14 opérés offrent de bons résultats après 4 ans. Les autres malades n'ont pas vu leur malade ulcéreux guérir, sans que l'auteur soit en mesure de les différencier des autres.

Il est probable que les deux splanchniques (gruiche et droit) agissent sur l'ensemble des fonctions gastriques, sans que l'on puisse, à l'heure actuelle, discerner leur part respective dans la pathologie digestive.

Tout le problème ulcéreux devrait être revu sous l'angle endocrinien sympathique.

PIERRE SMITH

Traitement du cancer du rectum par l'amputation abdomino périnéale en un temps avec conservation sphinctérienne Seneque, J *Presse Med*, 31 452, 1946

A la suite d'une communication de W Babcock de Philadelphie au congrès international de chirurgie de Lima, en avril 1946, communication illustrée d'un film en couleurs, le professeur Seneque vivement impressionné par la technique décrite s'est rendu à Philadelphie dans le service de Babcock au Temple University Hospital afin d'assister à une opération de cancer du rectum réalisée selon cette technique même et d'en observer les résultats. De retour à Paris, Seneque a opéré lui-même plusieurs cas en suivant la technique Babcock et s'en est déclaré satisfait, du moins lorsqu'il s'agit de cancers hauts situés de l'ampoule rectale.

L'amputation abdomino intrasphinctérienne de Babcock n'est pas nouvelle dans son principe, mais dans sa réalisation, en ce sens qu'elle permet—et Seneque l'a constaté—une cicatrisation en dix jours, sans anus préalable, avec conservation sphinctérienne.

Soins pré-opératoires minutieux à base d'huile de ricin et d'huile sulfamidés. Anesthésie à la rachiparacaine. Incision de Jalgauer étendue, mobilisation du côlon gauche, et ligature de la dernière sigmoïdienne pour permettre le déroulement du côlon sigmoïde, ceci dans le temps abdominal. Dans le temps périnéal incision intra sphinctérienne jointe à une fente verticale postérieure pour libérer la partie basse et descendre l'intestin et le néoplasme à travers l'appareil sphinctérien.

Les avantages de l'opération de Babcock sont une bonne exploration de l'abdomen, des risques de récidives moindres que dans la résection abdomino sacrée, pas de douleurs ou d'ostéites post opératoires, pas de risque de fistule sacrée ni d'écarts d'une suture colo rectale et réduction considérable de la durée du traitement.

Par contre, les qualités physiologiques fonctionnelles post opératoires sont supérieures après une résection qu'après une amputation intrasphinctérienne avec abaissement colique. Inconvénient qui ne suffit pas à condamner l'intervention de Babcock en regard des avantages considérables qu'elle procure et le lever précocité qu'elle permet.

PIERRE SMITH

Plastic Surgery and Burns

Present Evaluation of the Merits of the Z Plastic Operation Davis, J S *Plastic & Reconstructive Surg*, 1 76, 1946

The Z plastic manoeuvre is based on the transposition of two triangular flaps formed by the Z incision. Its success depends on the presence of lax tissue on each side of the contraction. The ideal place for the use of the Z plastic, single or in series, is in those instances where a web exists and the skin is of normal texture. Thus the method is applicable in the treatment of congenital webbing of neck, popliteal space and in partial syndactylism. Congenital grooves around fingers, wrists, arms, toes and legs may be treated by the Z plastic. It is commonly used in the treatment of deformities due to scar contraction. Thus a knowledge of the utilization of scar tissue in the final repair is essential. The patient should be in excellent physical condition pre-operatively. Operation is delayed until six months after healing. Failure may result from too early operation.

With the scar under tension the incision is marked with 5% brilliant green in alcohol. The central line of the Z is drawn along the most prominent part of the web. The arms of the Z are drawn parallel to each other, of equal length, and at 60°, to the central line. Angles between 60 and 20° can be used depending on the elasticity of the surrounding skin, the thickness of the flaps essential to viability, the location of the contraction, and the contour of the part. Flaps are under cut and transposed. The sutured wound is Z shaped but turned at approximately 90° to the original Z is

elongated, and the central line line transversely. Cyanoacrylate of the tips of the flaps may be treated by a few puncture wounds made by a pointed knife, gentle massage or the application of cold sterile normal saline compresses. Flaps should be handled with small sharp hooks. A voluminous pressure dressing is applied. All stitches are out by the 10th day. Massage is started after three weeks and continued for several months.

When the Z incision single or in series, is used on the fingers or wrist, flaps should be short. The use of multiple Z's in long contracted scars is valuable. The full amount of relaxation required may not be obtained by the first Z plastic. After six months, during which the tissues have been softened, and circulation improved, by massage, further relaxation may be obtained by repeating the Z plastic.

STUART GORDON

Early Covering of Extensive Traumatic Deformities of the Hand and Foot McDonald, J J and Webster, J P *Plastic & Reconstructive Surg*, 1 49, 1946

The closure of an open wound as soon as possible is a fundamental surgical principle. Early closure should be done by the most practical means in the absence of complications. If immediate closure is not possible, primary healing may be obtained by secondary closure. Neglect in early closure of wounds of hand or foot results in penalties costly and frequently permanent. Later reconstructive measures are more difficult.

If remaining viable skin flaps can be closed without tension this should be done. A split thickness graft can be used to cover larger denuded areas. This may be permanent if the bed is fat or muscle. Local flap may be used for covering important structures, the bed of the flap being covered by a split skin graft.

Marked swing in time may result from the use of an immediate pedicle graft. If this is not practical, immediate covering by split thickness graft should be done. Later this can be replaced by a pedicle graft.

Local closure should be delayed if other serious injuries are present, or when injury is so extensive that gangrene or infection is feared. Immediate local treatment is limited to debridement, application of a non-adherent pressure dressing and immobilization. Chemotherapy should be instituted. Four or five days later if the patient is out of danger the wound is further debrided and covered with a graft.

The impression that the plastic surgeon can always be relied upon to salvage and restore the damaged extremities is a contradiction. Consultation with the Plastic Service on all emergency cases in which there is loss of tissue allows adequate early treatment of tissue losses in hand and foot.

STUART GORDON

Obstetrics and Gynecology

The Aspiration of Stomach Contents into the Lungs During Obstetric Anæsthesia Mendelson, C L *Am J Obst & Gyn*, 52 191, 1946

Gastric retention of solid and liquid material is prolonged during labour. Aspiration of vomitus into the lungs may occur while the laryngeal reflexes are abolished during general anesthesia. Bronchial configuration favours right sided aspiration. Massive aspiration, however, readily involves both lungs.

Liquid material is more frequently aspirated than solid. Aspiration of solid material usually produces the classical picture of laryngeal or bronchial obstruction. Aspiration of liquid produces an apparently hitherto unrecognized asthmatic like syndrome with distinct clinical roentgenologic and pathologic features. The syndrome is due to the irritative action of gastric food or chloroform, which produces bronchiolar spasm and peribronchiolar exudative and constrictive reaction.

Aspiration of stomach contents into the lungs is preventable. The dangers of this complication in obstetric hazard may be avoided by (a) maintaining oral feeding during labour and (b) maintaining gastric administration where necessary (c) use of a gastric tube.

anaesthesia where indicated and feasible, (c) alkalization of, and emptying the stomach contents prior to the administration of a general anaesthesia, (d) competent administration of general anaesthesia with full appreciation of the dangers of aspiration during induction and recovery, (e) adequate delivery room equipment, including transparent anaesthetic masks, tilttable delivery table, suction, laryngoscope and bronchoscope, and (f) differential diagnosis between the two syndromes described and prompt institution of suitable therapy

ROSS MICHELL

Pathology

The Pathological Anatomy of Sudden Heart Death
Munch, W *Acta Pathologica et Microbiologica Scandinavica*, 23 107, 1946

This article analyzes 500 cases of sudden death due to heart disease, all of which had post mortems performed under medico legal auspices at the Medico Legal Institute of the University of Copenhagen. The material comprised 411 men and 89 women, the difference in sex incidence being due to the fact that autopsies are more frequently performed for medico legal and insurance purposes on men. There is a careful statistical study of the pathological findings with abbreviated case histories and some discussion of the literature.

The article is of interest to North American physicians because it discusses chiefly European literature on the subject and provides an opportunity for comparison. The series of cases is sufficiently large for its statistical analysis to be of real significance, in general the results confirm previous opinions, 334 cases or 79.2% showed coronary sclerosis of appreciable extent in 141 cases coronary thrombi were found, of which 105 lodged in the left coronary artery, 3 in the left circumflex, and 34 in the right coronary artery. In one case multiple thrombi were found. Cardiac rupture was noted in 26 times or 6.5% of 396 cases of coronary sclerosis. One instance of coronary thrombosis on a traumatic basis is recorded. Death occurred a few hours after a blow on the chest by a log, and a fresh thrombus was found at post mortem.

Syphilitic heart disease was found as a cause of death in 58 cases or 11.6%, while valvular disease accounted for 18 deaths or 3.6% and congenital heart disease for 9 deaths or 1.8%. The cases of congenital heart disease are of some interest in that some very rare deformities are described.

DOUGLAS FINDLAY

Urology

Neoplasms of the Testis Auerbach, Lieut O (MC), USNR, Brines, Capt O A (MC), USNR and Yaguda, Com A (MC), USNR *J Urol*, 56 368, 1946

This article reports a series of 26 cases of neoplasms of the testis seen between January 1, 1943, and January 1, 1946 at the United States Naval Hospital in Brooklyn. As this was one of the two naval hospitals designated for the treatment of malignant disease, the series represents the incidence of testicular neoplasms in a large population which cannot be exactly counted. It is also a select population in that only moderately young adult males in good initial physical health are included. This is of some importance in assessing the figures, because as the authors point out, undescended testicle is ground for rejection in the US Navy, and this factor of possible etiologic significance is therefore excluded.

Neoplasms occurred in both sides in about equal frequency. One case of bilateral tumour is noted. Painless enlargement of the testicle was the most frequent presenting symptom. The pattern of metastases was highly characteristic, in no case was evidence of direct extension seen, but metastases were found regularly in the retroperitoneal lymph glands at the level of the celiac axis, in 10 cases invading the inferior vena cava, in 18 cases in the liver, in 22 cases the lung, and in 26

cases cases in the mediastinal lymph nodes. The time of death from the onset of symptoms varied between 4 and 39 months. The authors are unwilling to classify their material pathologically, as they feel that as yet no satisfactory classification has been proposed. There is however, an illuminating discussion of this question.

DOUGLAS FINDLAY

Urinary Extravasation. A Study of Sixty Cases
Howland, W S *J Urol*, 56 387, 1946

The author points out that from the clinical point of view urinary extravasation and periurethral abscess are but two stages of the same process. His series of 60 cases comprises 29 cases of periurethral abscess in which the extravasated urine was limited to the space bounded by Buck's fascia and 31 of true urinary extravasation. This series originated in Atlanta, Georgia, and all but two of the patients were coloured.

Urethral stricture was responsible for 19 cases, the remainder were due to a variety of causes among them etheterization, calculi, gunshot wound, and external trauma. Of the series, 5 patients died. Treatment consisted of chemotherapy using sulfonamides and penicillin. Suprapubic cystostomy was required in 51 cases. The author attributes the low mortality rate of about 8% (as compared to previously reported series of 30%) to the use of chemotherapy.

DOUGLAS FINDLAY

Neurology

Fatal Aplastic Anaemia Following the Use of Tridione
and a Hydantoin Harrison, T F, Johnson, R D and Ayer, D *J Am M Ass*, 132 11, 1946

A sixteen year old girl was treated for seizures with tridione and methylphenylethyl hydantoin (mesantoin) over a period of six months. She developed an aplastic anaemia with a pancytopenia. White cells and platelet counts fell progressively in spite of frequent transfusions and other therapy given to stimulate hemopoiesis. It was felt that the drugs given were the etiologic factor.

PRESTON ROBB

Aplastic Anaemia and Agranulocytosis Following Tridione
Mackay, R P and Gollstein, W K *J Am M Ass*, 132 13, 1946

Tridione has been shown to be an effective anticonvulsant particularly in the control of petit mal and psychomotor seizures. However it is possible when the drug is used over a long period of time to produce an aplastic anaemia. If the drug is being used the blood should be checked regularly to look for early signs of this condition.

The authors report a case of a twenty four year old female who had taken tridione (3, 5, 5, trimethylolam zoline 2,4 dione) and phenobarbital for ten months in fairly effective doses. Seventeen days after the onset of headache, weakness and fatigue, the patient died of aplastic anaemia, agranulocytosis and thrombocytopenia. Autopsy revealed extensive hemorrhages throughout the body.

(It is worthy of note that in the same issue of this journal [*J Am M Ass*] a letter to the editor reports a third case of aplastic anaemia following the use of tridione. This patient recovered.)

As precautionary measures it was suggested that the drug should not be administered in any patient who has had a blood dyscrasia. Other measures of controlling the seizures should be tried first. It should be used in small doses at the start. The blood cells and platelets should be examined frequently, the interval not being more than a month. Patients should be instructed to report any unusual symptoms. Unprescribed sale of the drug should not be allowed.

Despite the unfortunate toxic effects of tridione revealed in this case, the drug offers great promise for effective control of the most stubborn of all convulsive disorders, if its dangers can be avoided.

PRESTON ROBB

Hygiene and Public Health

Effect of Double Bunking in Barracks on the Incidence of Respiratory Disease By the Commission on Acute Respiratory Diseases, Fort Bragg, North Carolina. *Am J Hyg*, 43 65 1916

That there is no objection to the general use of double bunking in barracks, provided that overcrowding is avoided, was the conclusion reached after a study was conducted into its effect on the incidence of respiratory disease in a battalion of newly recruited soldiers. The investigation was conducted in the Field Artillery Replacement Training Centre. Observations continued through a 17 week period of training. All mate barracks were equipped with double bunks, the others with standard army single beds.

Information regarding the incidence was obtained from dispensary and hospital records, the data from the hospital records being more specific than that from the dispensary records. In the hospitals, the detailed clinical, laboratory and epidemiological techniques employed made diagnosis possible according to the following criteria: acute respiratory disease of unknown etiology (ARD), atypical pneumonia, influenza A, and haemolytic streptococcal pharyngitis.

Tables and figures are included to show the findings. Although it was felt that further studies are necessary before adequate evaluation can be made, the results were nevertheless significant. During a period of epidemic of acute respiratory disease the incidence of hospitalized cases was significantly lower among the men living in double bunked barracks than among the men in the control barracks. A similar effect was observed for primary atypical pneumonia but the number of cases was too small to warrant conclusion. The peak of the epidemic of influenza occurred while the battalion was engaged in a field manoeuvre and it was therefore impossible to evaluate the effect of double bunking on the incidence of this disease. The cases of haemolytic streptococcal pharyngitis were confined to a small section of the battalion. All did not have equal exposure and it was therefore impossible to determine the influence of double bunking on this disease also.

It is suggested that double bunking might have its greatest effect on reducing the severe illnesses and little or no effect on milder cases. MARGARET H. WILTON

Cardiovascular Impairments in the Industrial Worker Connell, W. F. *Indust M*, 15 442, 1946

The author's conclusion that individuals with quite important heart disease are just as efficient, within their limits, as those with completely normal hearts, as stressed in this article. The average cardiac patient may, with proper handling, continue as a valuable economic asset for years after his disease first develops. The proper assessment and placement of these individuals in industry is an individual problem entailing a careful diagnostic study, together with an accurate evaluation of the functional and therapeutic status. The type of occupation for which the individual has been trained, must be considered. The author warns against undue solicitude and anxiety.

Excellent criteria for the proper classification of cardiovascular patients are to be found in the publications of the New York Heart Association. The Therapeutic Classification as prepared by this Association is an excellent guide to follow. Cases are classified as Class A—Physical activity need not be restricted. Class B—No unusually severe or competitive efforts are permitted. Class C—Ordinary physical activities are moderately restricted. Class D—Ordinary physical activities are markedly restricted.

The author illustrates the manner in which this guide may be used by reviewing the clinical pictures presented, together with assessment and classification, of such conditions as high blood pressure, coronary heart disease and valvular heart disease. MARGARET H. WILTON

OBITUARIES

Dr. Alexander C. Benty died suddenly on September 14. He was born October 10, 1860, near Garden Hill and has been a resident of the vicinity all his life. He was educated at Port Hope High School and attended Trinity Medical College, graduating with the class of 1890. With the exception of one summer practice with Dr. E. Clarke of Cobourg, Dr. Benty has served as family doctor to the neighborhood of Garden Hill since graduation.

His ability was not limited to the medical field however, as he founded and was the present owner of the Benty Telephone System which today serves a great part of Hope township. He was a member of the Telephone Pioneers of America.

He is survived by his widow.

Dr. Seraphin Boucher, former director of the Montreal Health Department, died October 6 in his 80th year at his home in Montreal.

Dr. Boucher was born at Sault au Recllet in 1865. After his classical studies at the Montreal College, he obtained his degree in medicine from the Victoria Medical School in 1889.

Following postgraduate work in France, he returned to Montreal to practise, later, receiving a diploma in public health from Laval University in Montreal, now the University of Montreal.

Dr. Boucher was appointed director of the Montreal Health Department in 1913, holding that office until December, 1937, when he was succeeded by Dr. Adolphe Groulx.

A member of the Royal Sanitary Institute of London and of the American Public Health Association with which he held the office of first vice president. Dr. Boucher was professor emeritus at the University of Montreal, member of the Cercle Universitaire, former chairman of the medical board of the Ste. Justine Hospital, governor of Notre Dame and Ste. Justine Hospitals, former administrator of the Caisse Nationale d'Economie and several other organizations.

McGill University awarded him an honorary degree of LL.D. in 1934 for his leadership and knowledge in public health.

He is survived by five sons and four daughters.

Dr. James Deacon Bruce, aged 72, vice president emeritus of the University of Michigan and past president of the American College of Physicians, died September 5, at Ann Arbor, following a cerebral hemorrhage. He was a native of Blackstock, Ontario.

He served with the British forces in 1910 as chief of medical services at Duchess of Cornwall Hospital in Chivedon, England, and joined an American hospital unit when the United States entered the war.

Dr. Bruce became chief of the medical service at University of Michigan in 1935.

Dr. Thomas Wilfred Hamilton, aged 51, medical superintendent at Fort San Siskit began in 1937 died there September 3. Born in Grand Island, Nebraska, Dr. Hamilton graduated from the Montreal Medical College in 1921 and was appointed to the staff of Fort San immediately following his graduation. He took postgraduate courses in Chicago and London, England. Dr. Hamilton was a member of both Masonic and Kiwanis club at Fort Qu'Appelle. Sick to him. He is survived by his widow and two sons.

Dr. Louis Lévesque died on September 29 at Rivière Bleue, at the age of 47 years. He was born at Rivière Bleue, at the age of 17 years. He studied at the college of Ste. Anne de la Pocatière and at the medical studies at the University of Laval. He spent his last years at Rivière Bleue depuis 1927. He is survived by his wife and regrets.

Il laisse dans le deuil sa femme, ses deux frères et quatre sœurs.

Dr R W MacCharles died in the Winnipeg General Hospital on September 16 after a long illness. Born in Cape Breton, N S 88 years ago, he graduated in medicine from Dalhousie University in 1891, and practised in Cypress River, Manitoba for two years, then moved to Manitou in 1895 and was there for thirty two years. In 1927 he came to Winnipeg and practised until his retirement in 1941. He was an elder in the Presbyterian church and during his stay in Winnipeg was an active member of Chalmers United Church. He is survived by a daughter and two sons, one of whom is Dr M R MacCharles of Winnipeg.

Dr Archibald George McPhedran died on September 18 at his home in Toronto after eight months' illness.

Dr McPhedran served for 10 years as a missionary under the Presbyterian Church of Canada in Central India. He was born near Wyoming, Ontario, and graduated in arts from the University of Toronto, winning a gold medal in physics. In 1901 he graduated in medicine and took postgraduate study in London, England and went to India in 1906. Retiring from missionary service in 1916 because of climatic conditions, he returned to Toronto and established a general practice.

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In July, 1941, Dr Snider was appointed temporary medical officer of health and became permanent M O H in March of this year. He was a member of the Kingsville Lions Club, ex officio member of the Victorian

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much greater and greater part in the work of the health department.

Dr Stephen D Clark of Lunenburg, N.B., surgeon, he fabled Miran by a little 100 lb and 22 lb. Miran's saloon and landed it at a struggle last night. Miran's another example of special skills exhibited by our profession.

Dr Murray Angvine, Professor of Pathology at the University of Wisconsin, was the special speaker at the Monthly Meeting of the Saint John Medical Society. His subject "Pathology of arthritis" was presented to a large gathering who welcomed the speaker to his hometown in the very warmest manner. At the social period at the evening's end Dr Angvine informally discussed many other modern trends in diagnosis and treatment.

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At the graduation exercises of the School of Nursing of the Victoria General Hospital Halifax Dr H K MacDonald gave the address to the graduates, recalling the history of nursing in that institution and his own experience in over fifty years of practice.

Dr D J Tomning Assistant Professor of Medicine, Dalhousie University attended the meeting of the New Brunswick Medical Society where he contributed a paper.

Just when the physicians of Nova Scotia were expressing the hope that the epidemic of acute anterior poliomyelitis would pass by, a number of cases occurred with one death. Excellent results have followed the treatment of new and old cases at the clinic, at the Nova Scotia Hospital, Woodside, under the direction of Dr C E Kinley.

The appointment has been announced of Doctor D M Grant as Medical Officer of the Workmen's Compensation Board. Dr Grant practised at Noel for several years until the outbreak of war when he joined the Royal Canadian Air Force. Since his discharge he has been practising in Middleton.

During the meeting of the Association of Compensation Boards of Canada held in Halifax in September the medical officers from the various provinces had the opportunity to visit the Anatomy Department of the Dalhousie Medical School where Professor Marshall gave a number of interesting demonstrations. He also visited Camp Hill Hospital to consult with Dr Healy on the Pensioners Branch of post-traumatic disability evaluation.

The medical student apprentice program was tried out this summer by the Dalhousie Medical School. It has apparently been a great success. A number of students who had a hard time in their first year were permitted to re-enter the school in the second year. In general practice under the supervision of the work in the office and on the ward. It is a very good thing that the doctor and the patient are both benefited by the program.

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much greater degree of responsibility in the health of the province.

Dr Stephen D Clark of Fredericton N.P. delivered a paper on "The Nursing Profession in the Future" at the 22nd Annual Meeting of the New Brunswick Medical Society. He outlined the future of the nursing profession and the need for a struggle to maintain the standards of the profession.

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Nova Scotia

At the graduation exercises of the School of Nursing of the Victoria General Hospital, Halifax, Dr H K MacDonald gave the address to the graduates, recalling the history of nursing in that institution and his own experience in over fifty years of practice.

Dr D J Topping, Assistant Professor of Medicine, Dalhousie University, attended the meeting of the Nova Brunswick Medical Society where he contributed a paper.

Just when the physicians of Nova Scotia were expressing the hope that the epidemic of acute anterior poliomyelitis would pass by a number of cases occurred with one death. Excellent results have followed the treatment of new and old cases at the clinic at the Nova Scotia Hospital, Woodside, under the direction of Dr C E Kinley.

The appointment has been announced of Doctor D M Grant as Medical Officer of the Workmen's Compensation Board. Dr Grant practiced at New Brunswick for several years until the outbreak of war when he joined the Royal Canadian Air Force. Since his discharge he has been practicing in Middleton.

During the meeting of the Association of Convention Boards of Canada, held at Halifax in September, the medical officers from the various provinces had an opportunity to visit the Antigonish Department of the Dalhousie Medical School where Professor MacLennan gave a number of interesting demonstrations. The visiting group also visited Camp Hill Hospital where Dr MacLennan of the Pensioners Branch on post-traumatic stress evaluation.

The medical student association of the Nova Scotia Department of Health, held a picnic at the Dalhousie Medical School on September 15. The picnic was held at the Dalhousie Medical School where the students were permitted to see the various departments of the hospital. The picnic was held at the Dalhousie Medical School where the students were permitted to see the various departments of the hospital. The picnic was held at the Dalhousie Medical School where the students were permitted to see the various departments of the hospital.

Ontario

The Toronto Academy of Medicine held the opening meeting of the 1946-1947 session on October 1. Two hundred Fellows with delegates from Hamilton Academy, London Academy, Academy of Dentistry, Canadian and Ontario Medical Associations and a number of distinguished guests met at dinner in Casa Loma. The President Dr George Boyer was in the chair and presented the past president's badge to Professor William Boyd whose year of office ended last May. The address of the President will be published in the Bulletin of the Academy.

Hon and Rev H J Cody, Chancellor of the University of Toronto reviewed the work of the year in the Faculty of Medicine, and Mr Sidney Smith, President of the University also addressed the gathering. The association of the University and the Academy is intimate. An interchange between the libraries has long been in operation. Hon George Drew, Premier of Ontario, enjoyed his meeting with the Academy and said so. A misconception of the Academy as being more or less of a social club was dissipated from his mind. The library of the Academy really serves the practitioners of Ontario rather than confining its services to its own Fellows. The work of the session is well under way in the new home of the Academy at the corner of Bloor West and Huron Streets, Toronto.

Dr W V Johnston of Lucknow, Ontario, Councillor of District 3, O M A, addressed a most effective circular letter to his constituents prior to the district meeting held in Walkerton on October 16. It had its effect as shown by the enthusiastic attendance at the meeting. Scientific papers were presented by Dr Charles C Ross and Dr J H Geddes, of London, and a long agenda occupied the business meeting until late in the afternoon. The annual dinner was held at Pleasant Valley Farm two miles east of Walkerton. The guest speakers were Dr C C White, president elect of the Ontario Medical Association and Dr W W Hughes of Embro who is a leading ornithologist. His address was illustrated by a coloured movie film synchronized with recordings of the songs of the birds shown in the picture.

Ontario Medical Association District No 1 held a two day session in Sarnia October 1 and 2 under the chairmanship of the counsellor, Dr E K Lyons, of Windsor. The first day was given to the business meeting with Prepaid Medical Care and Postgraduate Medical Education as principal features. In the forenoon October 2, a scientific and clinical program was presented by Drs J W Jackson, A M Borrowman, J D Kingsley, G B MacFarlane, C W McCutcheon, J F Roberts, C M Carruthers and J T Biehn all of Sarnia. In the afternoon, papers were read by Drs L N Silverthorne, Ian MacDonald and F G Kergin of Toronto. The session closed most happily by a dinner at the Sarnia Golf Club at which the guest speakers were Dr White and Mr Ralph Rowzee who spoke on synthetic rubber and its future.

Ontario Medical Association District No 8 held its annual meeting in Ottawa on September 26, with Counsellor H W Kerfoot of Smith's Falls in the chair. The business meeting occupied the forenoon and was followed by a buffet luncheon at the Ottawa Civic Hospital. In the afternoon Dr R G Smart and Dr F H Cote, of Ottawa, presented papers and Dr W Hurst Brown and Dr R C Lurd gave addresses. The meeting closed with a dinner at the Chateau Laurier to which ladies were invited. Dr C C White was the guest speaker.

In Kitchener, October 9, Ontario Medical Association District No 2 held its annual meeting with Dr M C Harvey in the chair. A business meeting occupied the forenoon and was followed by a luncheon given by the N Waterloo Medical Society. In the afternoon Dr Hermann E Bozer of Buffalo spoke on "Common

problems in otolaryngology" and Dr David K Miller of Buffalo gave a paper on "Pyrexias of uncertain origin." The dinner was addressed by Dr C C White and a program of entertainment was given.

M H V CAMERON

Prince Edward Island

Dr J D McGuigan, Charlottetown, has spent an enjoyable two weeks visiting relatives and friends in New Glasgow.

Dr J F McNeill, Summerside, has recently returned from Ottawa where he was attending the Executive Council meetings of the Canadian Medical Association.

Dr C J Stogdill, Chief of the Mental Health Division, Department of Mental Health and Welfare, Ottawa, has recently visited this Province. Dr Stogdill was on a tour of inspection regarding the existing Provincial facilities for the care of the mentally ill. On October 10 and 11 there was held in Ottawa a series of meetings at which provincial and federal men engaged in this work conferred with regard to correcting and improving existing conditions for the care of the mentally ill.

Dr H A Ansley, Assistant Director of Health Services, Department of National Health and Welfare, Ottawa, was in Charlottetown during August, organizing a joint provincial and federal milk survey unit. This unit has its headquarters at the Provincial Laboratory and is now actively engaged in surveying the milk situation throughout the province.

A J MURCHISON

Quebec

The Sugar Research Foundation were hosts on September 26 at a dinner in Montreal at the Mount Royal Hotel, to a large group of scientific and business men, both Canadian and American. The work and aims of the Foundation were shown to be directed towards research at leading university laboratories in regard to the rôle of sugar in diet and in scientific and industrial fields. The Foundation has brought together the majority of American and Canadian companies interested in the production and processing of sugar, the common object being that of fact finding in regard to the uses and consumption of sugar. It is frankly admitted that this may lead to greater use of sugar and so be of benefit from a business point of view, but that is not the primary object of the Foundation. In carrying out its program the Foundation which is only three years old, has already established a large number of research fellowships and endowments. Those of course began in the United States, but within the last year grants have been made for work in Montreal, under Dr I M Rabinowitch at the Montreal General Hospital, and Dr Hans Selye at the Université de Montreal. Both these men spoke at the dinner. Dr Rabinowitch pointed out the growing interrelationship between science and industry and went on to comment on the gaps in our knowledge regarding carbohydrate assimilation. Later he developed the idea that longevity might be very directly dependent on diet.

Dr Selye's remarks were directed towards the degenerative diseases from the point of view of over activity of the endocrine glands, and the research which is being done in his laboratory towards their possible control. As his audience was a mixed one he was obliged to reduce technicalities to more popularized form, no easy task, but he had a lucid form of expression which made it appear simple.

Dr Robert C Hackett the scientific adviser to the foundation also spoke briefly about the aims of the Foundation.

On projete a Grand'Mere la construction d'un vaste hopital, au cont de \$600,000. Cet hopital sera la propriete des Filles de Jesus qui en assureront la direction. Il aura 5 etages et pourra hospitaliser au moins 120 malades.

A la demande de 3 associations britanniques, le ministre de la sante du Royaume Uni a consenti a mettre a l'essai la vaccination contre la tuberculose par le BCG. On devra maintenant fabriquer en Angleterre le vaccin en question et commencer l'experimentation incessamment.

Les inspecteurs sanitaires du ministere de la Sante et du Bien Etre social ont fait au cours du mois de juin pres de 8000 inspections. Provenant du meme ministere on apprend que pres de 10,000 personnes ont beneficie en mai dernier des cliniques antituberculeuses et que 45,000 visites ou examens ont ete faits a des nourrissons et a des enfants d'age precolelaire. Les statistiques provinciales attestent que plus de 300 accidents de tous ordres se sont produits au cours des mois de juillet et aout.

JEAN SAUCIER

Saskatchewan

The Board of Governors for the University Hospital, University of Saskatchewan consists of Dr J S Thomson, president of the University of Saskatchewan, Dr W S Lindsay, dean of the college of medicine, University of Saskatchewan, L H Hantleiman of Plato, T Lav, deputy provincial treasurer, D Webster, deputy minister of public works, Dr T O Mott, chairman of the health services planning commission, and Dr C F W Hames, deputy minister of public health.

Appointment of a four man advisory council for the college of medicine at the University of Saskatchewan, under the provisions of the University act passed at the 1946 session of the legislature, has been announced by Premier T C Douglas, minister of health. The members of the council are Dr W S Lindsay, dean of the college of medicine, University of Saskatchewan, Dr J F C Anderson, Saskatoon, Dr C F W Hames, deputy minister of public health, and Dr F D Mott, chairman of the health services planning commission.

According to the terms of the act, Dr Anderson was appointed by and represents the College of Physicians and Surgeons. Dr Hames and Dr Mott were appointed by the minister of public health. Dr Lindsay is dean of the college of medicine, is a member *ex officio*.

The duties of the council are to report to the senate and the board of governors of the university concerning entrance qualifications, courses, general regulations and related matters.

General

American Academy of Dermatology and Syphilology—The fifth annual meeting of the American Academy of Dermatology and Syphilology is scheduled for Cleveland, Ohio, from Saturday, December 7 through Thursday, December 12. This will be the first meeting of the group since December, 1941, and it is expected to attract more than 1,000 members, according to Dr Osborne.

Most special lectures, special courses and symposia will be presented on the first four days of the week, beginning December 9. It is pointed out that the Academy is chiefly concerned with teaching and in consequence the entire session will be a sort of "post graduate" seminar for the visiting physicians from all parts of the United States and Canada. The annual banquet will be held Wednesday night of the convention week. Dr Harold M Cole of Cleveland is general chairman for local arrangements.

Life Insurance Medical Research Fund—On September 17 1946 the Board of Directors of the Life Insurance Medical Research Fund awarded 9 fellowships and 3 grants in aid of medical research in addition to those made previously this year. This brings the number of fellowships awarded in 1946 to 20 and the number of grants this year to 17. The total value of the grants in aid, some of which extend over two or three years, is \$633,591. The awards are all in connection with research on fundamental problems of cardiovascular disease or function. Amongst the awards the following are noted.

Postgraduate Research Fellowship to Dr Hugh Grant Skinner of New Toronto, Ontario, to work at the University of Toronto.

Student Research Fellowship was awarded to Mr Murray Saffran of Montreal, Quebec, to work at McGill University.

Grant in aid of research was awarded to McGill University of Montreal, for support of research under the supervision of Dr David W MacKenzie.

Applications for postgraduate research fellowships for 1947 should be made before January 1, 1947 to the Scientific Director, Life Insurance Medical Research Fund, New York Academy of Medicine Building 2 East 103rd Street, New York 29 New York. Applications for grants in aid of medical research for 1947 will be received until January 31, 1947. Nominations for student research fellowships in 1947 (which are made by faculty members) should not be made until later in the academic year, but must be received by April 15 1947. Further information may be secured from the Scientific Director.

K. C Hossick, of Ottawa has been named chief of the narcotic division. This division of the Department of National Health and Welfare is responsible for administration of the Opium and Narcotic Drugs Act and for carrying out Canadian commitments in the international regulation of the trade in narcotics.

Prior to joining the health department Mr Hossick was for nine years a member of the Royal Canadian Mounted Police as officer in charge of the medical division at headquarters in Ottawa. During World War I he served in France and Belgium in the 13th Battalion, Royal Highlanders of Canada, and later as an administrative officer and secretary with the director general of medical services. Mr Hossick is a director and vice president of Associated Medical Services, Inc., Toronto, and is a former executive officer of the Civil Service Association of Ottawa and the Civil Service Federation of Canada.

BOOK REVIEWS

Ancient Anodynes E S Ellis Late Anesthetist to the Gloucestershire Royal Infirmary, and Eve Institution 187 pp 21s Wm Heinemann, Medical Books Ltd, 99 Great Russell Street, London, W C1, 1946.

This volume gives the results of a life time of study on the development of our knowledge of drugs for the relief of pain not only those scientifically recognized, but also of those which in the past, among civilized nations and also aboriginal tribes have enjoyed a reputation as soporifics or even anaesthetics. Psychological anaesthesia be it of shrine or hypnotic character, is also dealt with.

A most interesting section has to do with the long history of popular knowledge regarding the effects of ether for everything except the elimination of pain. Its use as an anesthetic at so called ether parties preceded by many years its introduction to scientific medicine as a general anesthetic. The results of physiological studies having to do with the popular and popular are also of considerable interest.

There is an excellent foreword by T K Penniman, M A, Curator of the Pitt Rivers Museum, Oxford. The book is for reference more than to be read through. There is an extensive bibliography and a useful index. It can be highly recommended to those engaged in the teaching of anaesthesiology or those interested in medical history.

Carbohydrate Metabolism S Soskin, Director of the Research Institute 305 pp, illust \$6.00 The University of Chicago Press, 5750 Ellis Avenue, Chicago, Ill, 1946

In their preface to this book, the authors state that the volume is intended to serve as a correlative text for the teaching of carbohydrate metabolism to students of physiology, biochemistry and medicine, and should also be useful to the practicing physician, who seeks to keep abreast of the fundamentals upon which his clinical applications are based. There is no doubt that, with these purposes in mind, the authors have succeeded notably in their task. From the standpoint of its usefulness to the practicing physician, this text will be invaluable to all who are particularly concerned with diseases of metabolism, with special reference to diabetes mellitus, and will be of interest to any internist or surgeon who attempts to base his practice on sound biochemical and physiological principles.

Although the authors refer frequently to the older literature, the book deals chiefly with knowledge gained during the last twenty years, since the publication of the late Professor J J R Macleod's monograph on "Carbohydrate metabolism and insulin" in 1926. It is during this twenty year period that Dr Soskin has been active in contributing to the original literature. As a consequence, this book provides not only an excellent review of the entire field, but also a comprehensive picture of the valuable investigative work done by Dr Soskin and his colleagues.

The subject matter of the book comprises the biochemistry and energetics of carbohydrate metabolism, the nature, occurrence and origin of materials in the body important to carbohydrate metabolism, a critical survey of the classical criteria of diabetes mellitus, the rôle of the endocrine glands in carbohydrate metabolism and, finally, an integration of physiological and clinical aspects.

Principles and Practice of Tropical Medicine L Everard Napier, Companion of the Order of the Indian Empire 917 pp, illust \$11.00 The Macmillan Company of Canada Ltd, New York and Toronto, 1946

This is a quite complete textbook on the clinical aspects of tropical medicine. While a reasonable amount of space has been devoted to the laboratory side of the subject, it has not been over-emphasized as in some other texts. The treatments delineated are adequate and quite up to date. It is refreshing to find a textbook by one trained in the European School of Tropical Medicine which takes a rational view of the value of screens in houses, air conditioning, and light weight clothing.

It might perhaps have been better to have considered blackwater fever under the heading of malaria, although the author states that he considers it a special manifestation of malaria which has always been the reviewer's point of view. This book would provide a very satisfactory text for anyone desiring the latest and best information in compact form on tropical diseases.

Medical Aspects of Growing Old A T Todd, Honorary Physician, Bristol Royal Infirmary 164 pp \$4.50 John Wright & Sons Ltd, Bristol, Macmillan Company of Canada, Toronto, 1946

This little book is written out of the experiences of a wise and observant physician. It cannot be taken as authoritative since it contains some very dogmatic contradictions of current views on nutrition. These are not to be dismissed, however, as the opinions of a crank.

They are too well argued for that. At the same time, there is evident prejudice behind some of them. The physiology is sound and the understanding of the health problems of old people is deep. As a contribution to geriatrics the book is valuable and it should be read and put aside for rereading. Treatment is, perhaps, oversimplified but, after all, the correction of mal-digestion and the acquiring of proper habits of breathing are basic in dealing with the ills of the aged. The abuse of purgatives and hypnotics is sternly dealt with and the simple rules advocated are easy to follow. An occasional flash of cynical humor appears here and there and the book is packed with common sense.

Renal Diseases E T Bell, Professor of Pathology in the University of Minnesota, Minneapolis 434 pp, illust \$8.00 Lea & Febiger, Philadelphia, Macmillan Co of Canada, Toronto, 1946

This is a "compilation of studies on renal diseases carried out by the author during the past twenty-five years" with certain additions. Although written by a pathologist, an attempt is made to outline the clinical symptoms and findings in relation to the pathology. There are many lists of incidences of various conditions in autopsy material, and it includes extensive data about certain affections of the kidney. For example, there are twelve pages of tables summarizing the findings in chronic glomerulonephritis, and sixty pages of discussion of hypertension. Other diseases are dismissed more quickly, but actually omitted are only a few unimportant or uncommon conditions. There are very extensive lists of references, so extensive that one wonders why other workers are quoted without reference.




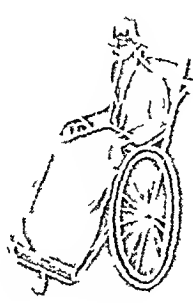
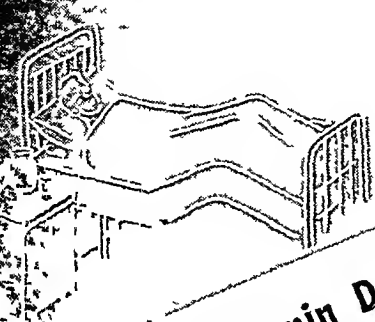
The book is physically attractive, the illustrations are profuse and generally of good quality, and the index although short is quite adequate. There are few typographical errors for a first edition. There are several statements of fact which would be held as highly debatable by other workers, but these are mostly in connection with the clinical urology.

Skin Diseases, Nutrition and Metabolism E Urbach, Associate in Dermatology, University of Pennsylvania School of Medicine, 634 pp, illust \$10.00 Gruno & Stratton, Inc, 443 Fourth Avenue, New York, N Y, 1946

This book contains a good deal of interesting material compiled from the writings of many ancient and modern authors, much also that has long been discarded with good reason. The choice of authorities appears to have been made with an indiscriminating eye. A great deal of the material presented is of a highly controversial nature, although this fact is not given sufficient notice. For the dermatologists and workers in other departments of internal medicine it may be found a convenient reference book as the bibliography is very complete. The general practitioner looking up a short cut to the cure of one of his personal dermatologic problems will be confused rather than helped. Every variety of food cultist and dietetic quack who chances to fall upon the book will find some support of a quotable nature for his pet notions.

The tables are numerous but not invariably helpful. In one, for instance, the same foods are listed in both the Prohibited and Permitted columns.

Far too many of the 266 illustrations do not illustrate. They are photographs with captions, and in many cases the photograph might have been supplied with any one of the other captions appearing elsewhere. Without any caption one would often fail to suspect what was being represented. Many are of the "before" and "after taking" type popularly identified with patent medicine advertising. On two successive pages such pairs of photographs appear, one labelled "influence of a low fat diet on psoriasis vulgaris", the other labelled with the same words except that "protein" has replaced "fat". In either case the caption might as well have been "influence of sunlight (or a ray, or salicylic white



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Sir W Arbuthnot Lane, His Life and Work W E Tanner, M.S., F.R.C.S. 192 pp, illust \$4.50 Bailière, Tindall and Cox, London, Macmillan Co of Canada, Toronto, 1946

This short biography is evidently a labour of love. It would be easier to read were it not so condensed and if the material were better arranged. The author has tried to avoid the appearance of hero worship and keeps his evident enthusiasm under very firm rein. He gives examples of the opposition of contemporaries and admits that certain of Lane's conceptions in physiology were not based very firmly on fact. He makes it clear that The New Health League which Lane founded and to which he devoted his later years has justified itself and the zeal out of which it began. Arbuthnot Lane was a great surgeon. His early work on middle ear disease and its sequelae is in itself enough to perpetuate his fame. His operation for cleft palate has long ago been adopted as a standard procedure and his work on internal reduction and fixation of fractures is fundamental and will perpetuate his name for ages to come. The strange fact is stressed that he became a surgeon because he was disappointed in not attaining a position as assistant physician in Guy's Hospital. His first five years of postgraduate training was taken with such an appointment in view. In this way he missed a grounding in the conservative principles of surgery as taught sixty years ago and brought a fresh view point with his work. It is hoped that the author may extend this study into a larger work. One of the most colourful figures in surgery and one of the great pioneers deserves the tribute.

Ambulatory Proctology A J Cantor, Associate Proctologist, Kew Gardens General Hospital, Long Island, New York. 524 pp, illust \$8.00 Paul B Hoeber, Inc., New York, 1946

This is a very practical book which will influence both the specialist and general practitioner. The author has definitely fixed the field of the proctologist, that of the anus, rectum and colon, and places this specialty on a higher basis, requiring extensive surgical training. Early postoperative rising is the present trend of all surgical cases, and applies particularly to proctology, as the majority of cases are minor surgery. If an office is fitted as an operating room, many cases can be treated surgically and sent home, thus materially relieving the acute shortage of beds. Obviously, however, resection of the sigmoid is a hospital procedure. One wonders how many postoperative Cantor encounters, but certainly the patients speak of after early penance the minor risk.

Several new ideas are also incorporated, namely, Treatment of Prolapse, Melanosis Coli, etc, also an extensive chapter on Intestinal Parasites.

Anatomical Eponyms J Dobson, B.A., M.Sc., Manchester. 240 pp, illust \$6.75 Bailière, Tindall & Cox, London, Macmillan Co of Canada, Toronto, 1946

The teaching of anatomy as all of us know, has undergone great changes in the last 25 years, in common with medicine generally. But there is one change which has been confined to anatomy alone, that, namely, which is concerned with nomenclature and more particularly with eponyms or the association of men's names with given structures. It is rather curious that anatomy should have been the one science to develop such a difference of opinion regarding this particular form of nomenclature. Other branches of knowledge, geology, botany, biology, chemistry, clinical medicine, willingly enshrine

in their phraseology the names of those especially associated with discovery or notable work. And so did anatomy until the B.N.A. revision came into being somewhere in the 1920's. The committee in charge of this went manfully to work on anatomical terms and it was the eponymic terms which suffered most. It should be added that not all the anatomists concerned with the Basle revision were in agreement with the changes in eponyms. There was a definite division of opinion, and the feeling was so strong on both sides that a compromise was agreed on, which later became an almost complete acceptance of the abolition of eponyms.

Now, all the arguments on both sides are most satisfactorily presented in this volume and with a "sweet reasonableness" which should leave us, one would hope, in no doubt as to the very great value of eponyms. It may not be possible for a long time to reinstate in anatomical language the names which Gray and Cunningham in earlier editions made so familiar, although there are laudable signs of some of them reappearing here and there. But meanwhile this dictionary will go far to remind students and others of the long list of those who contributed to our knowledge of human anatomy, whilst at the same time constituting an authoritative and detailed source of reference not before assembled under one cover.

Cardiovascular Disease in General Practice T East, Physician and Physician in charge of Cardiological Department, King's College Hospital. 198 pp, illust, 2nd ed 12s 6d H K Lewis & Co Ltd, 136 Gower Street, London, W.C.1, 1946

The second edition of this book, just published in 1938, is a concise statement of the diagnostic problems and therapeutic resources associated with cardiovascular disease. Throughout this short volume there has been a studied avoidance of discussion, of quoting other points of view, of attention to matters not of immediate importance in the care of patients with heart disease by the general practitioner.

The arrangement of the text is along conventional lines. Characteristic of the book are the chapters dealing with heart failure which elucidate the findings, means of diagnosis and treatment, but carefully avoid complicated discussion as to oedema formation or the theories behind its proper treatment. Regarding congenital heart disease the author has selected those which may now be subject to operative treatment and has discussed concisely their recognition and differential diagnosis. In view of the urgency of accurate early diagnosis in the thyrotoxic heart disease, seven pages are devoted to its consideration as compared with five pages on rheumatic heart disease.

There is no chapter on electrocardiography and no electrocardiographic tracings are included. No attempt is made to discuss the fluoroscopic study of the heart but there are a number of cardiac silhouette figures. Scattered throughout are statements as to the place of these specialized methods of study in the diagnosis of heart disease.

Fever Bark Tree M L Duran Reynals. 275 pp \$3.50 Doubleday & Company, Inc., New York, Mc Clelland & Stewart, Ltd, Toronto, 1946

A vast amount has been written on the subject of malaria, but most of it has been on the more severe lines of scientific treatises or histories. Since the Japanese attacked the East Indies and vast Allied armies invaded some of the most malarious regions in the world, public interest in the disease and particularly in quinine has grown rapidly. It is high time therefore for an accurate and complete treatment of this whole subject. Mrs Duran Reynals's book admirably fills this need. Here Chio, that elusive goddess, has a good couturière to show off her best points.

This is an excellent example of popular historical writing. There is vivid writing free from the excesses that mar so much of this sort of work. Facts are not sacrificed to dramatic effect. First rate balance is

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—Review in *The Canadian Hospital*,
September, 1946



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preserved with faithfulness to sources (a most interesting bibliography is appended). The theme is vast and contains material for a score of novels. The author fuses her knowledge of history and of medicine to brilliant effect. The whole drama of fevers is presented from ancient times down to the modern industrial struggle for the control of anti-malarial agents, the romantic story of quinine has never been told more delightfully. Here are recreated with a novelist's skill such figures of the past as Francesco Torti, Gideon Harvey, Svidenham, Sir Robert Talbot (too little known to medical men), Mutis, Laveran and Ledger. The narrative gives the reader the account of the Brazilian epidemic of malaria of the last ten years, the amazing story of Java quinine industry, the struggle in which individuals, governments and commercial interests played for high stakes with the more benign medical gods well in the background. The part of malaria in war is set down from Alexander the Great to General MacArthur.

It is well to have the story brought up to date, and here we are in Miss Dorian Reynolds's debt. The account of the way in which the Allies maintained the production of anti-malarial drugs during the recent war is as exciting as any of the previous chapters in the narrative. Malaria continues to play itself out in a drama that is packed with incident and tragedy. And now that quinine may be superseded by more effective anti-malarial agents, it is of advantage to have its full story set down, together with that of its most recent rival, atabrine.

This book cannot be commended too highly. Here is history on the grand scale concisely presented with full consideration to light and colour. It should make fascinating reading for the lay public, for physicians, and for all those interested in the vital stuff of history.

Human Embryology B. M. Patten, Professor of Anatomy in the University of Michigan Medical School. 776 pp., illust. \$7.00. The Blakiston Company, Toronto, and Philadelphia, 1946.

Dr. Patten has written about human embryology in a fresh and inspiring manner, which is indeed an achievement in a field already crowded with texts. Intricacies of development are unfolded to the reader as if the author were a daily witness to the scene, seeing each process clearly and simply.

This text does not deal with a static embryology of embryos fixed at ten, twenty or thirty millimetres in length. Rather, it presents an organism in transition, continuously developing and growing. This dynamic approach starts with the ovum and follows on in an interrupted sequence until the fetus is fully formed. Chemical import and function are dominant notes. In short, this is a remarkably good embryology text for student and physician alike.

Human Embryology (Prenatal development of form and function) W. J. Hamilton, M.D., D.Sc., F.R.S.E., Professor of Anatomy in the University of London at the Medical College of St. Bartholomew's Hospital, J. D. Boyd, M.A., M.Sc., M.D., Former Fellow of Clare College, Cambridge, Professor of Anatomy in the University of London at the Medical College of the London Hospital, and H. W. Mossman, M.S., Ph.D., Associate Professor of Anatomy in the University of Wisconsin. The Williams & Wilkins Company, Baltimore, 1945.

This book of 366 pages and 364 figures, many in colour, gives a full view of the human development as seen by specialists of Britain and the United States of America. It is dedicated to the late Professor Bryce of Glasgow and to Dr. Streeter of Baltimore, former director of the Department of Embryology of the Carnegie Institution of Washington. One can hardly read it without being impressed with the enormous amount of brilliant research which has come out of this Institution. For instance, the earliest stages of the human embryo have there been worked out, and also

the even earlier stages of the monkey embryo. The presentation is clear and explicit, and the illustrations unusually good, particularly as they appear on coated paper. The volume is authoritative and may unhesitatingly be recommended to medical students and all others desiring to have an up-to-date presentation of this important subject. There are free correlations with ancillary subjects such as heredity and biochemistry.

John and William Hunter J. M. Oppenheimer, Bryn Mawr College. 188 pp., illust. \$6.00. Henry Schuman, New York, 1946.

Any book dealing with the two "crusty" brothers from Lunarkshire who were destined to raise surgery and obstetrics to the level of respected sciences is certain to possess great interest. These two biographical essays of Miss Oppenheimer's, however, have much more interest than pertains to narratives of real life that contain the elements of superb fiction. In admirable historical writing she recreates the Hunters as they are revealed in their relationships with their intimate circle and their contemporaries in the social and political world.

The first essay is a study of John Hunter's brother-in-law, Sir Everard Home, and in particular a review of one of the celebrated incidents in the history of science, Home's burning of John Hunter's manuscripts thirty years after Hunter's death. Miss Oppenheimer's final judgment takes the middle ground. Home's act in her opinion was "not so much a part of deliberate crime as of ordinary human folly and fallibility." He was a man "who was not so much wicked as he was unwise," whose "failings were at once the fruit of his own weakness and of Hunter's greater strength."

The second part of the book is a study of William Hunter in his rôle of anatomist, obstetrician and man of the world. Lacking the dimensions of an all-round study, it is still an interesting estimate of an imperious and ambitious Scot who became a member of the glittering society of eighteenth century London. The author clearly shows that Hunter's contributions to medical progress were greater than is commonly acknowledged, while as a personality he was too much the man of the world.

The book is one of the series of publications issued under the auspices of Yale Medical Historical Library. Mr. Schuman has, as always, favoured the medical profession with a fine example of book making.

Medical Biochemistry M. R. Everett, Professor of Biochemistry, University of Oklahoma School of Medicine. 767 pp., 2nd ed., 106 tables. \$7.00. Paul B. Hoeber, Inc., New York, 1946.

This work was intended primarily as a textbook, and as such it can be confidently recommended to undergraduates in medicine and to those practitioners who have need of revising their knowledge of biochemistry. This present edition is more massive than most student's texts, but one should not be frightened by the book's size. This is due partly to the finer grade of paper used and partly to the inclusion of numerous topics which are frequently omitted in standard texts. These topics include short discussions of immunochemistry, allergy, the biochemistry of inheritance, chemotherapeutic agents, and steroid compounds in medicine.

Dr. Everett's style is lucid and straightforward. He avoids controversial theories and is didactic to a degree. The result is a simplicity of presentation which is greatly to be desired in a student's book, but in avoiding controversy the appearance of simplicity so gained is perhaps misleading. He uses a wealth of chemical material to illustrate the points he makes. This is done in a very effective way and adds greatly to the book's interest. However, in dealing with the chemical material he is not on such sure ground, chiefly because limitations of space do not permit him to do justice to his topics. For instance, twelve lines on the Rh factor or eight on the biochemical aspects of radium sickness are of little value. As the book is a text on a laboratory subject, this is perhaps not fair criticism, but the point



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Throughout the book are numerous tables, listing the properties of various compounds, which are of great value. The bibliography is extensive and includes references up to January, 1946. A brief addendum on a Guide to Biochemical Literature will inform the beginning student as to the most efficient way of getting information about any given topic. All in all, this edition should further establish the book's popularity.

Injuries of the Knee Joint I S Smith, Surgeon in charge, Orthopaedic Hospital, Ladbroke, Stirlingshire (Scottish D M S) 320 pp, illust \$10 50 E & S Livingstone Ltd, Edinburgh, The Macmillan Company of Canada Ltd, Toronto, 1946

This book represents the concentrated experience of the author during five years with Service personnel approximately 5,000 cases were seen during this time of which 2,000 were treated in his Orthopaedic Unit.

The whole field of traumatic disorders is covered, with stress on injuries to (1) synovial membrane, (2) menisci, (3) ligaments, (4) extensor apparatus, (5) articular fractures, (6) bursae.

The first chapter is devoted to a consideration of the importance of the quadriceps and the physiotherapeutic approach to the education. Of special interest is his recording of experience with the regeneration of semi-lunar cartilages and the description of his instruments devised for complete excision of the menisci. The final chapter is devoted to the stiff knee and the importance of the injury in fractures of the thigh and leg is emphasized.

This monograph is a most valuable contribution to the surgical literature and will be an excellent guide to surgeons in this field. It is well written, fully illustrated and of good format.

Morel Mackenzie R Scott Stevenson 199 pp, illust 15s Messrs William Heinemann, Medical Books Ltd, 99 Great Russell Street, London, W C 1, 1946

This is the first full length study of a *cause celebre* of the late nineteenth century to see print. With admirable historical sense Mr Scott Stevenson, himself an otolaryngologist, has set down a well written and fully documented narrative of the strange and dramatic episode in which a distinguished Victorian physician was caught in the violent and muddy currents of European politics. It is a tragic tale, and students of medical history will be glad to have it fully set out between the covers of one book.

Sir Morel Mackenzie is justly regarded as the founder of laryngology. He was a man of great talents, the first protagonist of the scientific study of disease of the throat in the English speaking medical world, the founder of the first hospital for diseases of the throat in the world, and the author of the pioneer classic on the subject, *Diseases of the Throat and Nose* published in 1880. He had a distinguished medical and social career. But he was a man of complex and contradictory character. Gifted with many fine traits, he was a man of great pride, apt to be bellicose and hot tempered and, in modern phrase, a bit of a show man. These qualities which enabled him to do battle for the new throat specialty against a hostile profession, ironically and tragically implicated him when he became entangled in a case which involved the European political scene whose master at the time was the powerful and crafty Bismarck.

In 1887 Mackenzie was summoned to examine the Crown Prince Frederick of Germany, later for ninety

nine days Emperor Frederick III, and the father of Kaiser Wilhelm II. Frederick had a growth on one of his vocal cords, and the majority of his German medical advisers, believing it to be malignant, had advised removal of the larynx. Mackenzie secured two bits of the growth for biopsy which was carried out by Virchow and reported benign. As a result no operation was performed, and Mackenzie was manoeuvred into a position by which the responsibility for the whole case was his. From that time on, and more so after the Emperor's death, a storm of controversy and the most malignant charges—medical and political—broke about Mackenzie's head. Most unprejudiced observers and particularly Frederick, his wife and family believed that Mackenzie did the right thing, and in the long run made his patient more comfortable. On Mr Scott Stevenson's summing up of the evidence there seems to be no question but that Mackenzie made his diagnosis in good faith and not for political reasons so that the pro-English Frederick might ascend the throne. Unfortunately, stung by the torrent of abuse, Mackenzie was ill advised enough to publish in popular form a defence of himself, *The Fatal Illness of Frederick the Noble*, in which he dealt as savage blows as he received. Thus brought down upon his head the censure of the British profession, involved him in a libel action and threw a cloud over his last years, and—as has transpired—over his subsequent reputation.

Mr Scott Stevenson deserves our thanks for bringing the whole sad story into proper perspective. He not only gives us a fine character analysis, but paints a vivid backdrop of Victorian England and the medical world of the period. His achievement reminds us of the fine study of another tragic figure of the same period, Sir William Wilde (Oscar Wilde's father) written by Dr T G Wilson four years ago. It is greatly to the credit of our British medical colleagues to find such first rate writers in their ranks.

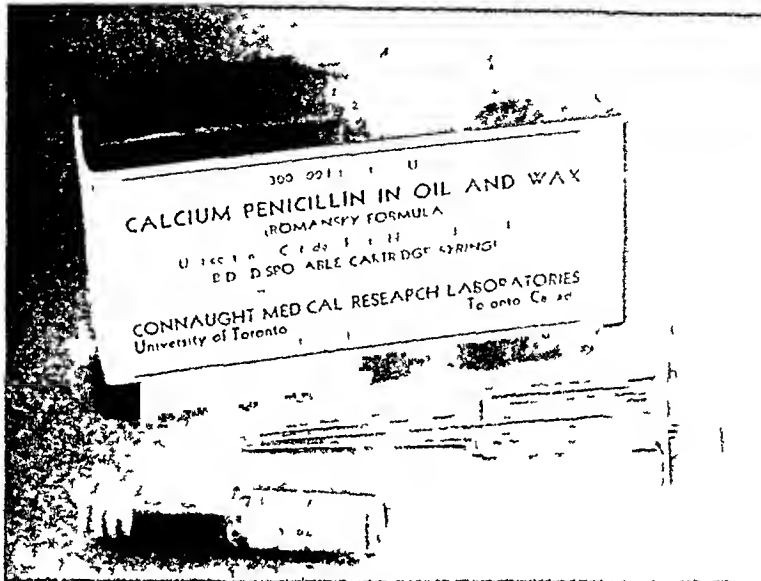
Ocular Prosthesis J H Prince, Late Regional Association Lecturer in "Comparative Ocular Anatomy" 101 pp, illust \$5 25 E & S Livingstone Ltd, Edinburgh, The Macmillan Co of Canada Ltd, Toronto, 1946

This book fills a long existing need. It forms a complete treatise on the history, manufacture, and fitting of ocular prostheses. Though principally designed for the technician in this field, in that it goes into considerable detail regarding the anatomy and physiology of the orbit, none the less it will be read with profit by the oculist.

Practical Handbook of Midwifery and Gynaecology W I T Haultain, Obstetrician and Gynaecologist, Royal Infirmary, Edinburgh, and C Kennedy, Assistant Obstetrician and Gynaecologist, Royal Infirmary, Edinburgh 388 pp, illust, 3rd ed \$6 00 E & S Livingstone, Edinburgh, Macmillan Co of Canada, Toronto, 1946

This book follows the pattern of previous editions, discussing the various divisions of obstetrics and gynaecology in a brief, synopsis form. Chapters have been added on the infant, use of x-ray in obstetrics and gynaecology, the therapeutic use of hormones and drugs in labour. The chapter on x-ray simply enumerates various conditions in which x-ray may be helpful. Only two and a half lines are devoted to x-ray measurement of the pelvis. The therapeutic use of penicillin is mentioned only once in the book and then for the treatment of gonorrhoea. Dosage and method of administration are not discussed. The rh factor is briefly mentioned in the chapter devoted to the infant, but its importance in transfusion and obstetrical practice is ignored. It is included as a cause of abortion along with a list of about thirty other causes. The chapter on hormones lists various commercial preparations and enumerates broad indications for their use. One is surprised to find pelvic drainage recommended if signs of peritonitis develop during the puerperium, and hot vaginal douches

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The subject matter is presented in such a brief and synopsis form that the book is not suitable as a text for students. It might prove of value, however, for concentrated review before examination.

Peptic Ulcer I W Held, Consulting Physician, Beth Israel Hospital, New York, and A A Goldbloom, Assistant Clinical Professor of Medicine, New York Medical College and Flower Fifth Avenue Hospital, New York 382 pp, illust \$6 50 Charles C Thomas, Springfield, Illinois, 1946

As mentioned in the foreword the authors include in their monograph all types of peptic ulcer and deal with the subject from every angle, though they have avoided prolonged theoretical discussions.

Part 1 deals with simple ulcer, gastritis, and functional dyspepsia. Part 2 includes ulcer with complications. Chapters are devoted to punctures, perforations, retention, hæmorrhage, and malignant degeneration. The indications for medical and surgical treatment are outlined in detail.

The book is well illustrated and each chapter includes a good bibliography. The subject is well covered without too much theory or detail.

Problem of Lupus Vulgaris R Aitken, Lecturer in Diseases of the Skin, Edinburgh University 69 pp, illust \$4 50 E & S Livingstone Ltd, Edinburgh, Macmillan Co of Canada, Toronto, 1946

This monograph is written by a world recognized authority on lupus vulgaris. There is an excellent chapter on clinical features and treatment. The next chapter on ultra violet irradiation is one of the clearest descriptions of the Finsen and Finsen Lomholt lamps that I have read. Tuberculin treatment of lupus is then described and discussed by one who has had much experience. The final chapter is on the problem of lupus vulgaris. The author makes a plea for notification of the disease by all practitioners, and then for proper treatment of these cases in properly equipped treatment centres. He urges that all cases of lupus vulgaris be allowed to live normal lives by having their disease treated and arrested early and then being accepted by society. It is unfortunate that there is no plea for public health measures to attempt to stamp out lupus entirely.

Recent Advances in Neurology and Neuropsychiatry W R Brain, Physician to the London Hospital and the Maida Vale Hospital for Nervous Diseases, and E B Strauss, Physician for Psychological Medicine, St Bartholomew's Hospital 363 pp, illust, 5th ed \$5 75 The Blakiston Company, Philadelphia, McClelland & Stewart, Limited, Toronto, 1946. Reprinted 1946.

The American edition of this work maintains the high standards set by other volumes of the "Recent Advances" series. It consists of a series of papers summarizing the more noteworthy innovations together with a critical judgment of each. The result, therefore, resembles the fruit of much journal reading and experience by an expert rather than the didactic orderly presentation of a textbook. In a sense this book, like its companion volumes, falls between two stools: its very nature precludes its use as a textbook by students and interns, while its small size and unavoidably brief presentation limits its value to the specialist. It should, however, find a useful place as supplementary reading for both classes of readers, and should be of special interest to the general practitioner wishing to revise his knowledge of nervous diseases.

This edition marks a change in title from "Recent Advances in Neurology" to the present one and in the preface the authors are at great pains to emphasize the close relationship which must necessarily obtain between neurology and neuropsychiatry. The book's

cover, however, adheres to the former title, and the book itself is limited fairly sharply to neurology. The only psychiatric topics discussed are the physical methods of treatment of the neuroses and psychoses (electroconvulsive therapy and prefrontal leucotomy), electroencephalography in neuropsychiatric disorders, the psychological effects of head injuries, and various neurologic questions of interest to the psychiatrist such as the nature of sleep, the physiology of the emotions, and so forth.

Squint and Convergence N A Stutterheim, State Medical Qualification, Holland 90 pp, illust 15/ H K Lewis & Co Ltd, London, 1946

This small book in reality is a monograph outlining the author's opinions regarding the causation of convergent strabismus, and its treatment. The author's thesis regarding these matters is that the concepts commonly in use today are inadequate. He believes that fusion is not an entity, but a physiological phenomenon, a mere result itself. He centres the fusion of binocular vision about convergence. The development of his thesis makes entertaining and stimulating reading, though he has a disturbing faculty of expressing hypotheses in the form of dogmatic fact. For this reason his book is not suitable for the student. However, those who have an intimate knowledge of this particular field will find it thought provoking.

BOOKS RECEIVED

Chemical Composition of Foods R A McCance and E M Widdowson 2nd ed, 156 pp 6s 0d Medical Research Council, 38, Old Queen Street, Westminster, S W 1 His Majesty's Stationery Office, London, 1946

Clinics Edited by G M Piersol, Professor of Medicine, University of Pennsylvania 271 pp, illust, vol IV, No 5, J B Lippincott, Philadelphia, Pa

Human Torulosis L B Cox, Honorary Neurologist, the Alfred Hospital, Melbourne 149 pp, illust \$2 51 Melbourne University Press, Carlton, N 3, Melbourne, Victoria, Oxford University Press, Melbourne and London, 1946

La Parálisis Infantil Epidémica M E Glanzmann, Professor de Pediatría de la Universidad y Jefe del Hospital Infantil Jenner, de Berna 33 pp, illust Ediciones B, P, Callo Calabria, 66 a 176, Barcelona, 1946

Problems of Family Life Agatha H Bowley, Psychologist, the School Psychological Service, Leicester 98 pp \$1 50 E & S Livingstone Ltd, Edinburgh, The Macmillan Co of Canada Ltd, Toronto, 1946

Results of Radium and X-ray Therapy in Malignant Disease Ralston Paerson, Margaret Tod and Marion Russell 147 pp 7s 6d (\$2 50) E & S Livingstone Ltd, 1617 Toronto Place, Edinburgh, Macmillan Co of Canada, Toronto, 1946

Sanitary Science Notes H Hill, Sanitary Inspector and E Dodsworth, Sanitary Inspector 135 pp 7s 6d H K Lewis & Co Ltd, 136 Gower Street, London, W C 1, 1946

Some Minor Ailments of Childhood B Twyman, M B, B S 32 pp \$0 32 E & S Livingstone Ltd, Edinburgh, Macmillan Co of Canada, Toronto, 1946

Tumores Glomulos I Martorell 110 pp, illust Editorial "Miguel Sorvet", Barcelona Madrid, 1940

Annual Reports How to Plan and Write Them B K Tollers \$1 00 National Publicity Council, New York, 1946

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¹ WHIPPLE, G. H., F. S. ROBCHEIT, ROBBINS and C. B. WALDEN. B₁₂ liver extract response in iron deficiency anemia. *Am. J. Med. Sci.* 170: 433-437, 1955.
² MOORE, C. V. Iron and the essential trace element in World Medical Dictionary, 11th ed., W. B. Saunders Co., 1945, pp. 93-107.

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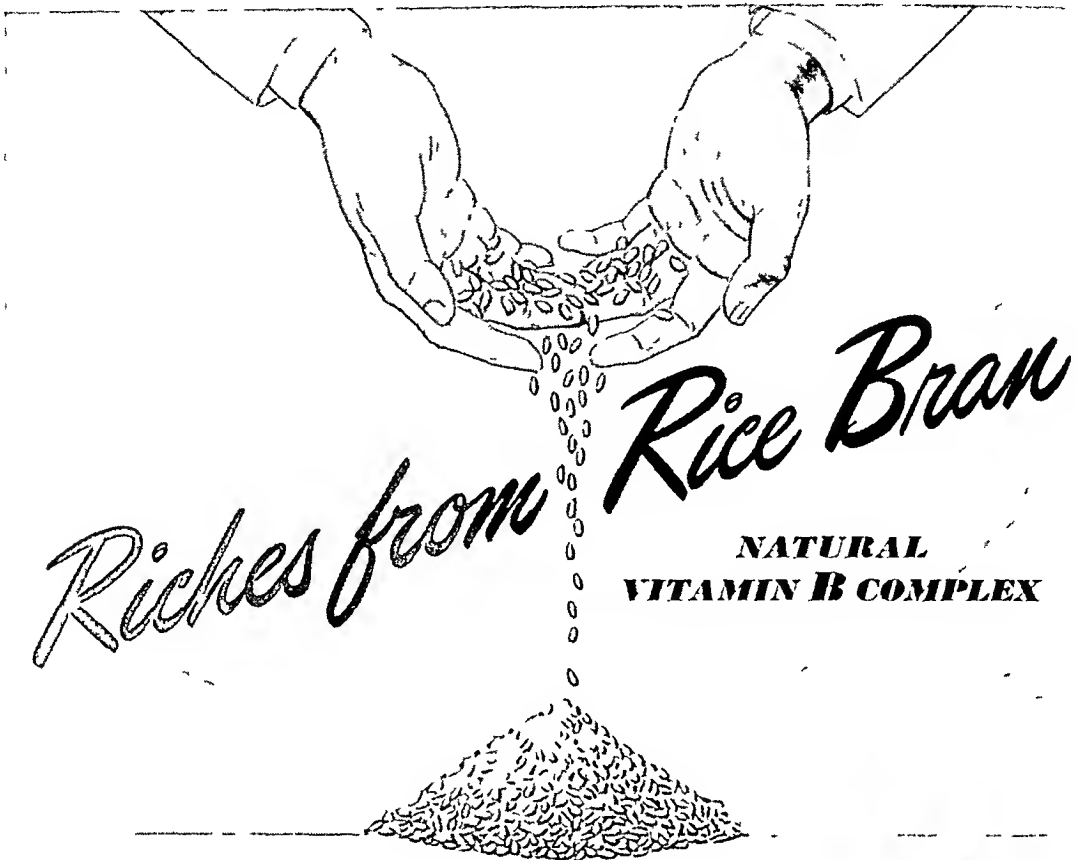
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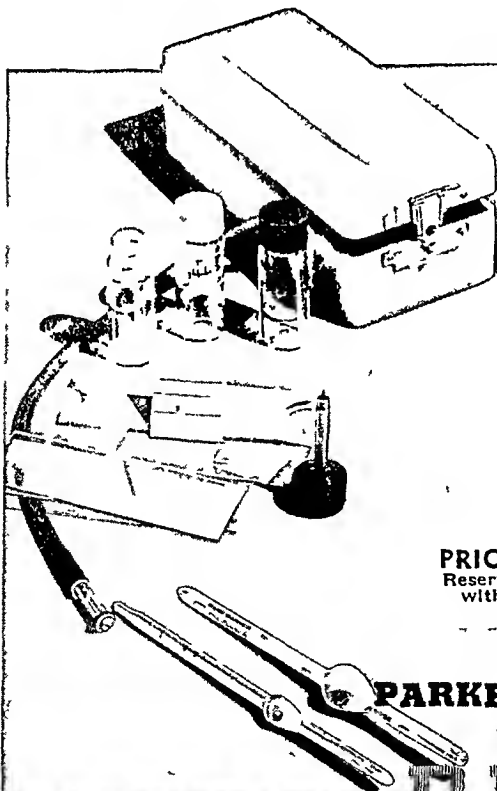
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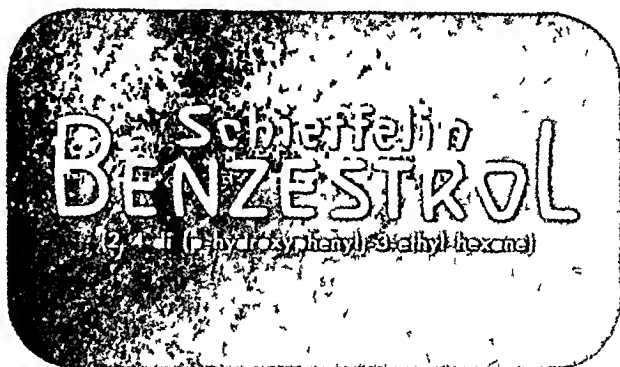
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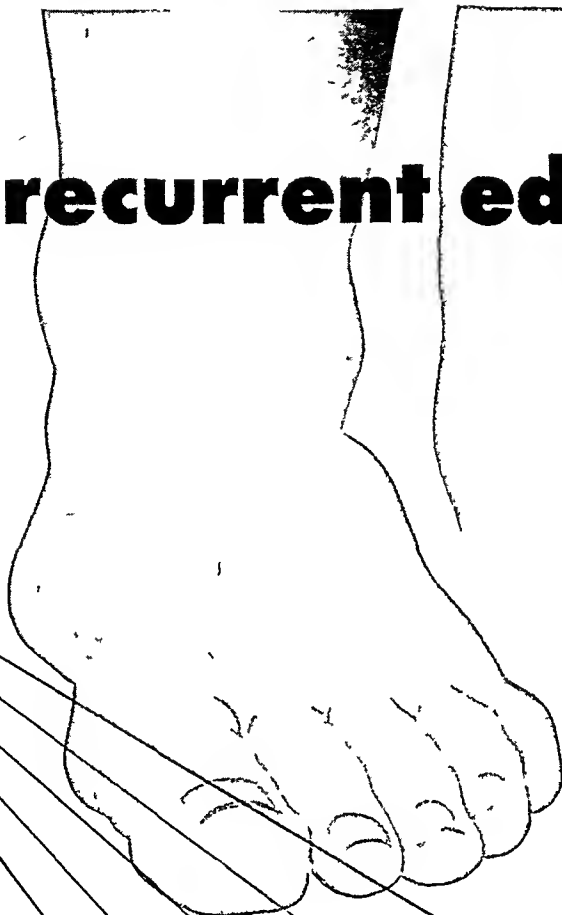
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¹ Conferences on Therapy. New York State J. Med. 44:280, 1944

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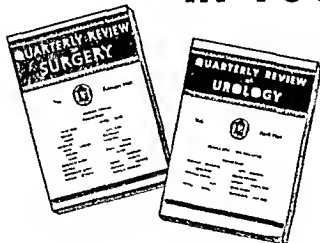
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SPINK, W. W., and HALL, W. H. *Penicillin Therapy at the University of Minnesota Hospitals 1942-1944*. *Ann Int Med* 22:510 (April) 1945.

WHITE, W. L., MURPHY, F. D., LOCKWOOD, J. S., and FLIPPIN, H. F. *Penicillin in the Treatment of Pneumococcal Meningococcal Streptococcal and Staphylococcal Meningitis*, *Am J Med Sc* 210:1 (July) 1945.

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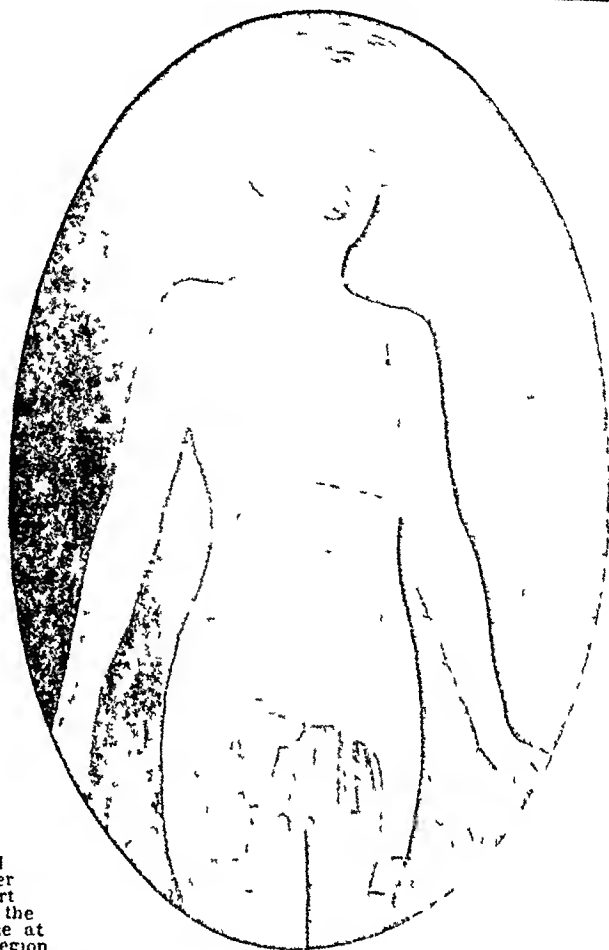
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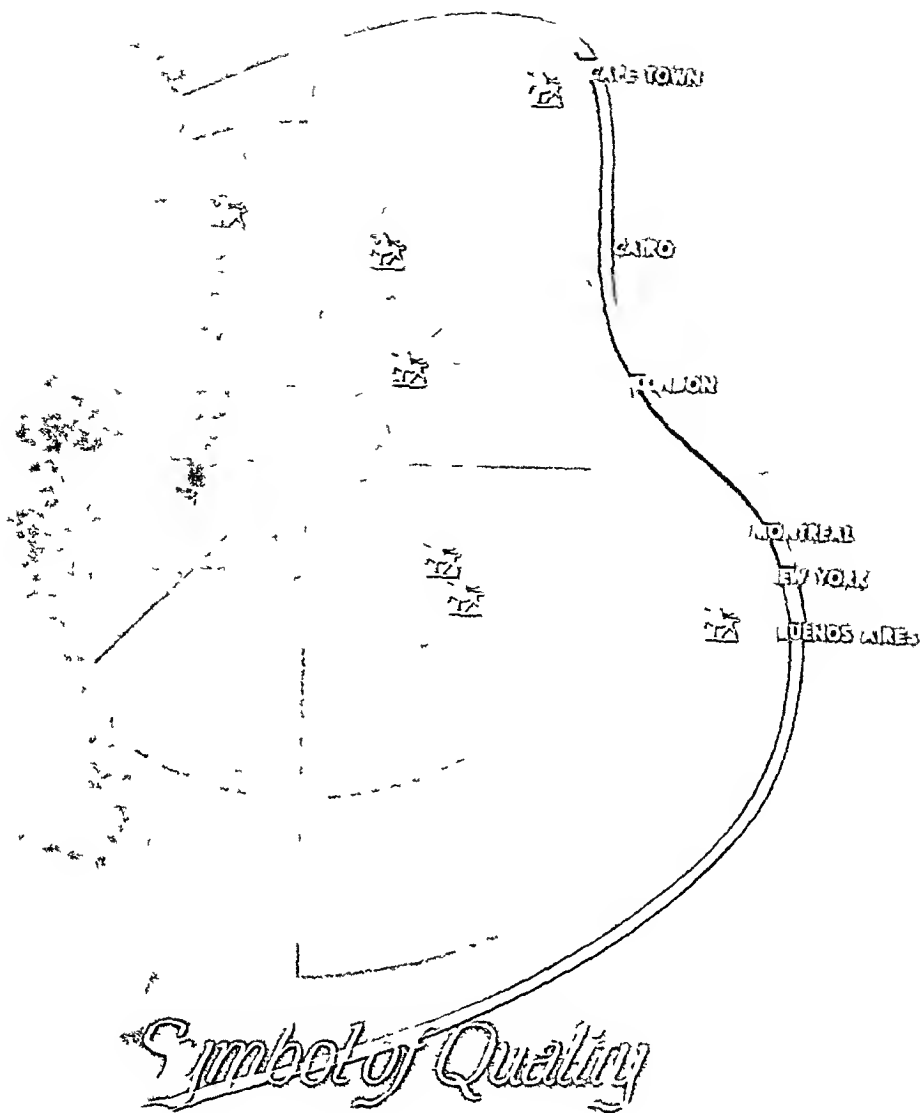
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Every Fall and Winter, the rigours of the Canadian climate take their toll of the average citizen in the form of head colds, sinusitis and rhinitis

The problem of relieving the nasal congestion associated with these conditions can be effectively solved by the prescription of

'Wellcome' Brand Ephedrine Isotonic Solution

(Aqueous) Containing 1 per cent Ephedrine in a modified Locke's solution it has four distinct advantages which recommend it to the discriminating physician

- 1 It has an immediate and prolonged effect
- 2 Unlike oily preparations or those containing various antiseptics it does not impede ciliary function
- 3 It is non irritating and
- 4 Is not followed by after congestion

Available in bottles of 1 and 16 fl. oz.
Literature on request



'WELLCOME' BRAND EPHEDRINE ISOTONIC SOLUTION (AQUEOUS)



By the Spoonful

Each teaspoonful provides 25 mgs of Vitamin "C" plus adequate quantities of the proven factors of the B-Complex

Syrup C-B Concentrate is a valuable dietary supplement indicated particularly in infancy and childhood, during pregnancy and lactation and in all conditions characterised by dietary restrictions, faulty absorption or lack of appetite

An exceptionally palatable preparation containing no alcohol



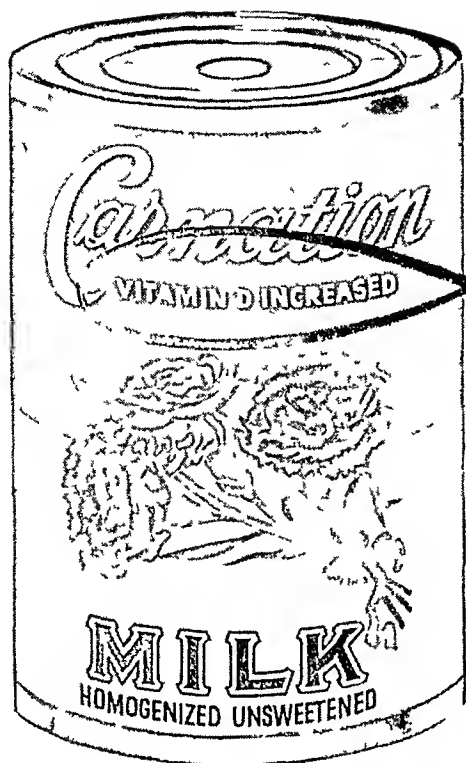
FORMULA

	PER FL ounce	PER tsp
Ascorbic Acid (Vitamin C)	200 mg	6.66 mg
Thiamine Hcl (Vitamin B ₁)	6 mg	0.20 mg
Riboflavin (Vitamin B ₂)	6 mg	0.20 mg
Niacinamide	25 mg	0.83 mg



Mowatt & Moore Ltd
FINE PHARMACEUTICALS
MONTREAL

SYRUP C-B CONCENTRATE



Vitamin D Increased to 400 INT. UNITS

PER RECONVERTED QUART

FOR optimal growth in normal infants and children, for good bone and tooth development, and for additional protection against rickets, the vitamin D potency of Carnation Milk has been greatly increased by irradiation. Now a reconverted quart (half Carnation, half water) supplies 400 International units as against 162 units formerly introduced by irradiation. The revised label shown above identifies this nutritionally improved milk which is now nationally available.

CARNATION COMPANY, LIMITED, TORONTO

Carnation



"FROM CONTENTED COWS"



Milk

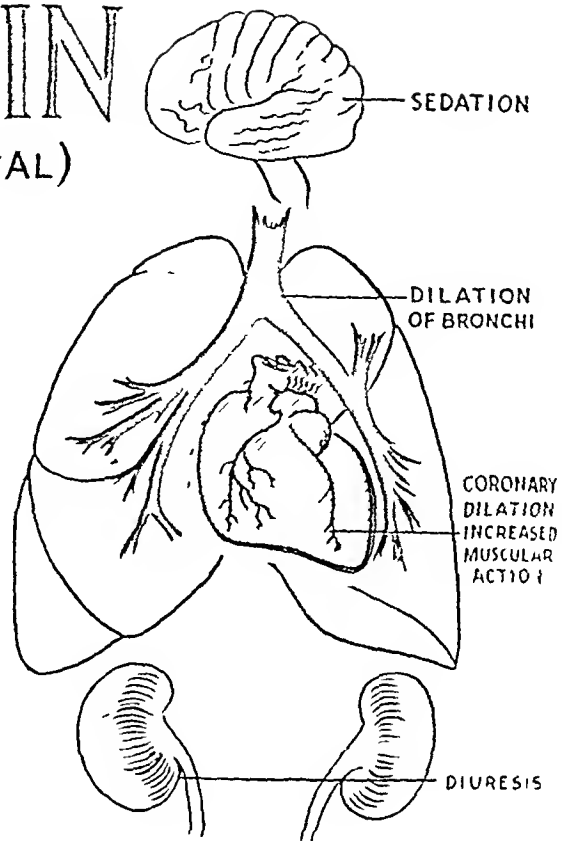
A Canadian Product

HENOPHYLLIN

(THEOPHYLLINE and PHENOBARBITAL)



- DIURETIC IN CONGESTIVE HEART FAILURE.
- CORONARY ARTERY DISEASE.
- ASTHMA—HAY FEVER.
- CHEYNE STOKES RESPIRATION.



Enteric Coated Tablet PHENOPHYLLIN contains*—

Theophylline and Sodium Acetate	100 mg (1½ grains)
Phenonyl (Phenobarbital)	30 mg (½ grain)

PHENOPHYLLIN WITH DIGITALIS—To Increase Cardiac Augmentation

Each Enteric Coated Tablet contains*—

Theophylline and Sodium Acetate	100 mg (1½ grains)
Phenonyl (Phenobarbital)	30 mg (½ grain)
Digitalis Powdered B P	30 mg (⅓ grain)
	0.3 International Unit equivalent in activity to 5 minims Tincture Digitalis B P

PHENOPHYLLIN WITH EPHEDRINE—To Increase Dilation of Bronchi

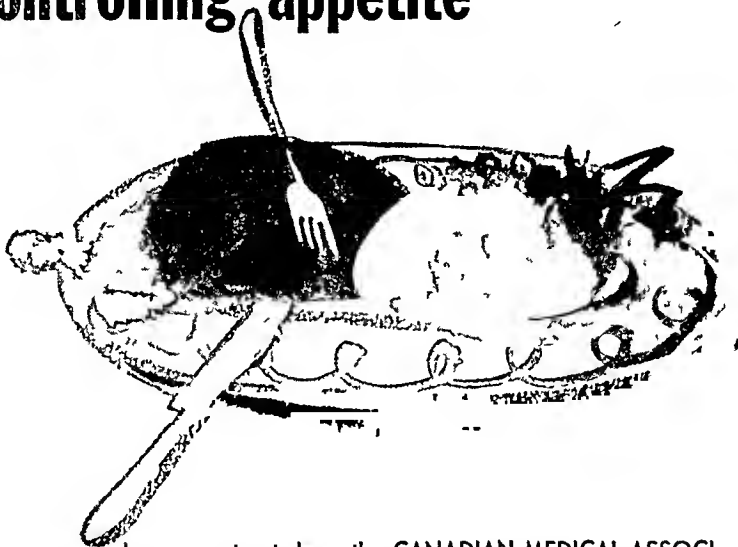
Each Enteric Coated Tablet contains —

Theophylline and Sodium Acetate	100 mg (1½ grains)
Phenonyl (Phenobarbital)	30 mg (½ grain)
Ephedrine Hydrochloride	25 mg (⅓ grain)

*Available in Tablets 100 mg and 1,000 mg

CHARLES R. WILL & COMPANY LIMITED
LONDON CANADA

highly effective in controlling appetite



In a recent article in the CANADIAN MEDICAL ASSOCIATION JOURNAL,* Dexedrine is appraised as "a very useful appetite depressant drug in the treatment of obesity"

The authors found that DEXEDRINE enabled overweight patients to adhere closely to a restricted diet "without feeling it too great a burden"

Dexedrine is also indicated in the treatment of depressive states, alcoholism and allied conditions. Exerting a sustained cerebral and psychomotor stimulation, Dexedrine is particularly valuable whenever the physician wishes to administer a drug combining preponderant central nervous effect with relatively weak peripheral activity

*Hawirko L and Sprague P H Canad M A J 54:26 (Jan) 1946

Dexedrine Sulfate Tablets

Dexedrine Sulfate Tablets are manufactured in one size only—5 mg

(Dextro-amphetamine sulfate, S K F)

Smith, Kline & French Inter-American Corporation
Philadelphia and Montreal

The ANALGESIC FOR HOME USE ...



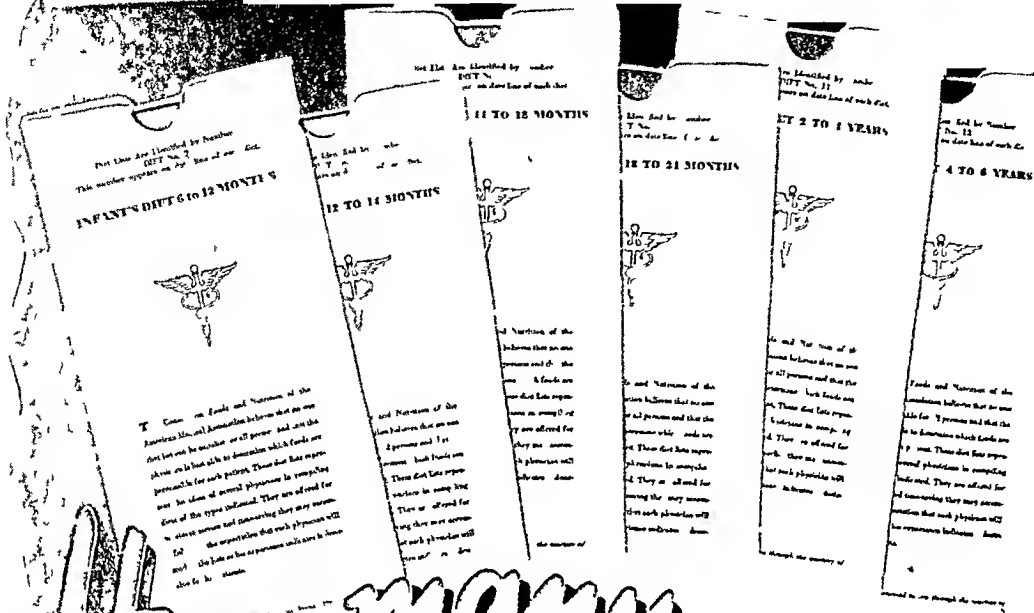
The Bayer Laboratories have specialized in the production of ASPIRIN for over forty six years. Only the finest and purest ingredients are used in its manufacture. Every batch made is subjected to complete and rigid scientific controls. Seventy different tests and inspections have been developed to insure the quality, purity and uniformity of the finished product.

“ASPIRIN”

"EXCEEDINGLY HELPFUL AND USEFUL" . . .

"JUST WHAT I HAVE TRIED TO OUTLINE MYSELF"

"NOT ONLY TIME-SAVING BUT ALSO EFFICIENT, SELF-EXPLANATORY AND WELL-"



*How many
may we send you?*

DOCTORS' COMMENTS on our diet lists have almost routinely been COMPLIMENTS. If you are not acquainted with our free diet sheet service, why not use the coupon to request samples of the lists prepared for infants and children? Imprinted without charge with your name, address and telephone number

"Junket Brand Foods, Division of Chr Hansen's Laboratory
Makers of Rennin products including Junket Rennet Powder & Tablets

"JUNKET" is the trade mark of Chr Hansen's Laboratory for its rennet and other food products, and is registered in Canada and United States

Make milk into
Rennet Custards with either



MAIL THIS COUPON TO:

'JUNKET BRAND FOODS,
Division of Chr Hansen's Laboratory,
833 King St W., Toronto, Can

Please send me specimens of your infants' and children's diet lists. Also samples of Junket Rennet Powder and Tablets

Name _____ Please Print

Address _____

City _____ Prov _____



Allenburys

I-SO-GEL

Indicated in Chronic Constipation, Colitis and
Gastro-Intestinal Disorders

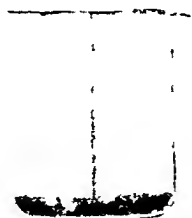
The essential therapeutic property of I So Gel is that it acts by reproducing the normal stimulus to intestinal peristalsis—namely, bulky intestinal contents—through absorption of water in the alimentary canal

I-SO GEL is a granular preparation of dried mucilage and contains no purgatives. It is almost tasteless. It is specially suitable for the constipation of diabetics.

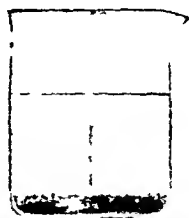
It is valuable also in mucous colitis, dysentery, haemorrhoids, and intestinal flatulence, after the performance of colostomy. I SO GEL gives excellent results by solidifying the faeces.



*I-So Gel is available in 6 oz, 12 oz, 24 oz,
and 4 lb containers*



1 LEVEL TABLESPOONFUL
OF I-SO GEL GRANULES



+ 7 OZS
OF WATER



= THIS AMOUNT OF
MUCILAGINOUS JELLY

Complete literature supplied on request

THE ALLEN AND HANBURY'S COMPANY LIMITED
LINDSAY, ONTARIO LONDON, ENGLAND

The peasants used egg white



Bandages stiffened with albumen served as crude casts for the treatment of fractures among the Italian peasants as late as 1843.¹ Cheselden² and Belloste,³ among others, advocated the method professionally.

Today's casts are much more effective therapeutically—especially when made with Curity Ostic Plaster Bandages and Splints

Consider these special features of Curity Ostic Plaster Bandages

- wetting-out time 3-4 seconds
- setting time 6-7 minutes
- **AMOUNT OF PLASTER DELIVERED TO CAST** 90%—compared with 65% for ready-made loose plaster bandages
- quick drying time—effects stronger casts
- moisture-proof packaging—no preset plaster

The big advantage of Ostic Plaster Bandages is, of course, their *hard-coated finish*. You can pick up a dry Ostic bandage without dispersing loose plaster about you. And when you immerse the bandage, significantly less plaster is lost in the immersion water. To achieve these desirable features, high-grade plaster of Paris is scientifically bonded to starch-free Ostic Crinoline—an exclusive Curity product—by a special baking process.

Improvement, speed, economy
speedy wetting out, setting and drying help realize savings in time and bandages, sturdier and less expensive casts. For speed, economy and better patient care, rely on Curity Ostic Plaster Bandages and Splints—you can't do better today!

1 Biaga Lodovico Del Trattamento di alcune Fratture con l'Apparecchio inamidato Letter to Prof Antonio Ralkern Florence 1843

2 Cheselden W Anatomy of the Human Body 7th ed London 1756

3 Belloste Augustin Le Chirurgien d'Hôpital Paris 1692 p 330

CURITY OSTIC PLASTIC LINE

Bandages - Splints

Products of

BAUER & BLACK

Division of The Kendall Company (Canada) Limited, Toronto, Ontario



RESEARCH TO IMPROVE TECHNIC...TO REDUCE COST

Curity
REG. IN CANADA



You Enjoy Foods With Fine Flavour, Colour, Texture—

AND SO DO THE BABIES IN YOUR CARE!



• Naturally, quality is always the first consideration when you're recommending foods for the babies in your care. And fine flavour, colour and texture are important, too. That's why so many physicians prescribe Heinz Strained Foods. Scientifically prepared according to quality standards 77 years old, Heinz Baby Foods are outstanding on every count for your newer patients.



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The Search for Allergens

* The task of determining the factor responsible for an allergic disturbance may be extremely difficult. Secondary factors which can complicate the condition also must be taken into account.

Have you considered cosmetic allergens as possible causative or contributory factors in diagnosing your allergic cases?

Marcelle hypo-allergenic Cosmetics are formulated particularly for the allergic patient, since known irritants have either been removed or reduced to tenable minimums. Many physicians have prescribed Marcelle hypo allergenic Cosmetics for 14 years as a wise precautionary measure in treating their allergic patients.



*Acceptable for advertising in publications of
the American Medical Association for 14 years*

MARCELLE COSMETICS, Inc.

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TO COUNTERACT "DESERT NOSE"



THE distressing dryness of sensitive, vascularized nasal mucosa—occurring during the prodromal stage of coryza, as a result of climatic conditions, or subsequent to the instillation of aqueous nasal medication—may frequently be prevented or relieved by the administration of Pinealeum Compound. Intranasal application by dropper or spray causes a protective oily film to be spread over the membranes, sealing in their natural moisture (requisite for nasal health and comfort)—and locking out micro-organisms provocative of more serious respiratory complications.

• Proved thoroughly safe for normal adult use in controlled clinical experiments*, Pinealeum is gratefully received by patients. For additional tissue shrinkage, an effective—but rebound-free—dosage of ephedrine is supplied in Pinealeum with Ephedrine.

Formula. Pinealeum Compound contains camphor (0.50%), menthol (0.50%), eucalyptus oil (56%), pine needle oil (1.00%), and cedar oil (0.75%) in a liquid petrolatum base—plain or with ephedrine (0.50%).

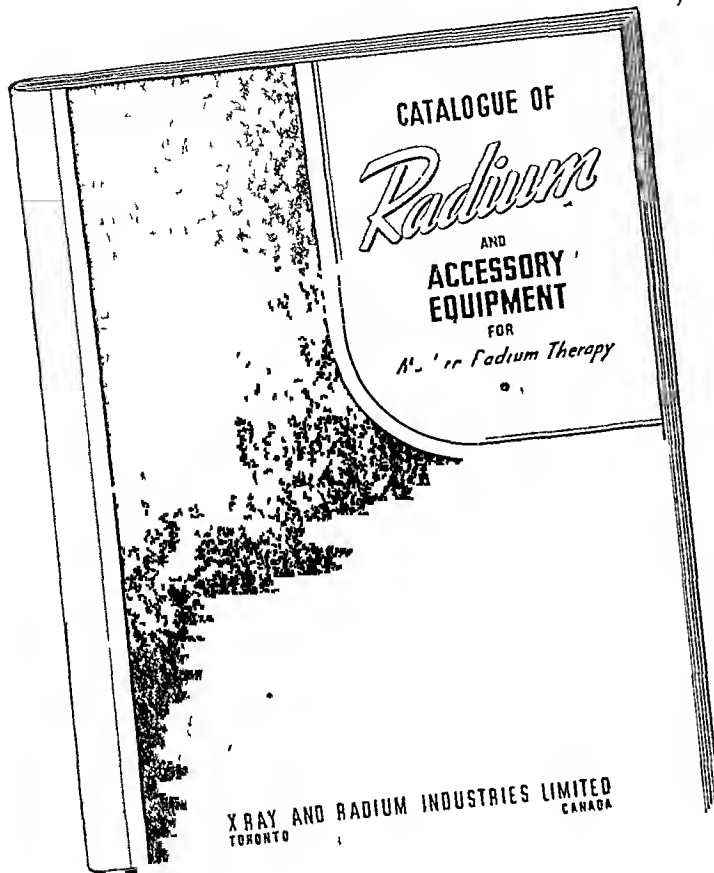
Dosage Forms. Available in dropper bottles, with complete atomizer set.

*Graceman, B. I. Arch. Otolaryngology 50:184, 1944; Abst. JAMA 125:172, 1944; Yearbook of Eye, Ear, Nose & Throat, 1944, p. 69. Also Novak, I. I., Jr. Arch. Otolaryngology 55:241, 1943.

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This illustrated catalogue gives complete specifications and details of the forms in which radium is supplied. It shows all types of containers, American and European needles, tubes, cells and plaques. Also described are the many applicators adapted to specific uses and the accessory equipment required in the handling of radium.

X-Ray and Radium Industries provide a complete service for inspection, detection of leakages, repair of equipment and conversion to new types of radium containers. For a copy of the new catalogue and advice on your problems, write the nearest office listed below.

The famous KELEKET line of X-Ray Equipment

This line of complete equipment, accessories and parts is exclusive with X-Ray and Radium Industries in Canada. It includes a full range, from portable to deep-therapy units, high-intensity X-Ray film illuminators, stereoscopes, fluoroscopes and cassettes.

Branches in Vancouver, Calgary, Edmonton, Winnipeg, Toronto and Montreal are now in operation. Representatives are located in all principal cities. At these offices expert service and technical advice are provided by technicians and engineers of proven qualifications and years of experience.

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and REGAIN

ELASTOPLAST Technique was evolved with 'Elastoplast' Bandages and Dressings. The successful results described in the medical press and reprinted in the handbook 'Elastoplast Technique' were achieved with 'Elastoplast' Bandages and Dressings. The combination of the particular adhesive spread used in making 'Elastoplast,' with the remarkable stretch and regain properties of the 'Elastoplast'

cloth, provides the precise degree of COMPRESSION and GRIP shown by clinical use to be essential to the successful practice of the technique.

These properties, peculiar to 'Elastoplast,' have produced a bandage used for many years with outstanding success by the Medical Profession throughout the world.

Note 'Elastoplast' has a SOFT non-fray edge.

Elastoplast

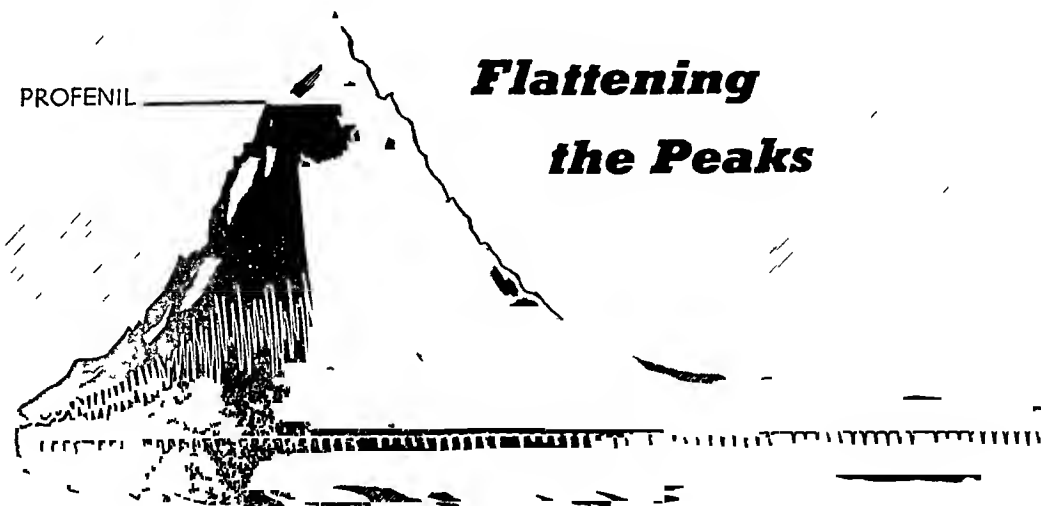
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Distributors

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Made in England by T J Smith & Nephew Ltd., Hull

PROFENIL

***Flattening
the Peaks***

Clinical results with PROFENIL* in smooth muscle spasm parallel the findings in experimental studies.

Irrespective of the therapy employed in gastrointestinal or biliary disease, Profenil is suggested as a routine measure for the control of the associated spasm

Tablets for oral use contain 0.06 Gm. of Profenil citrate

Ampoules for parenteral use contain 0.045 Gm. of Profenil hydrochloride

Suppositories for rectal use contain 0.048 Gm. and 0.024 Gm. of the base (Adult and Child)

*The Review of Gastroenterology Vol 12, Number 6, pages 436-439, Nov.-Dec. 1945

profenil

NEW SYNTHETIC
NON-NARCOTIC

Antispasmodic

(bis gamma phenyl propylethylamine)



Lafontaine
LABORATORIES LTD

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The cod liver oil produced in clean, modern plants along the Atlantic seaboard

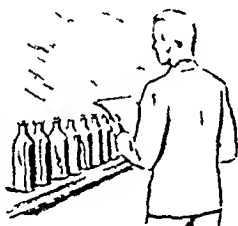
and the Gaspe coast



equals the finest produced anywhere It exceeds

all the requirements of the British and U S Pharmacopoeias and is especially rich in

Vitamin A It is fresh from the



sea to the drug trade, sparkling clear,

mild in odour and flavour. Cod liver oil of such fine quality can be



prescribed with perfect confidence Why use a foreign product when we have one

second to none right here at home?

Atlantic Cod Liver Oil Produ

In treating Para-nasal Infection



Bacteriostatic Decongestion is the MEANS



Restoring Normal Function is the GOAL

with **ARGYROL**

*the Decongestant without
Rebound Action*

In recent literature emphasis is being given to the after effects that frequently follow use of vasoconstrictors because of their rebound action

Such untoward results do not accompany the use of ARGYROL, the bacteriostatic decongestant that

AVOIDS THAT VICIOUS CIRCLE

When the physician uses ARGYROL he knows that he is contributing most to recovery through support of nature's own First Line of Defense

The cleansing, demulcent, bacteriostatic action of ARGYROL is attained by its three-fold action



Three-Fold Action of ARGYROL

1. ARGYROL is decongestive, without irritation to the membrane, and without ciliary injury
2. ARGYROL is powerfully bacteriostatic, yet is non toxic to tissue
3. ARGYROL stimulates secretion and cleanses, thereby enhancing Nature's own first line of defense

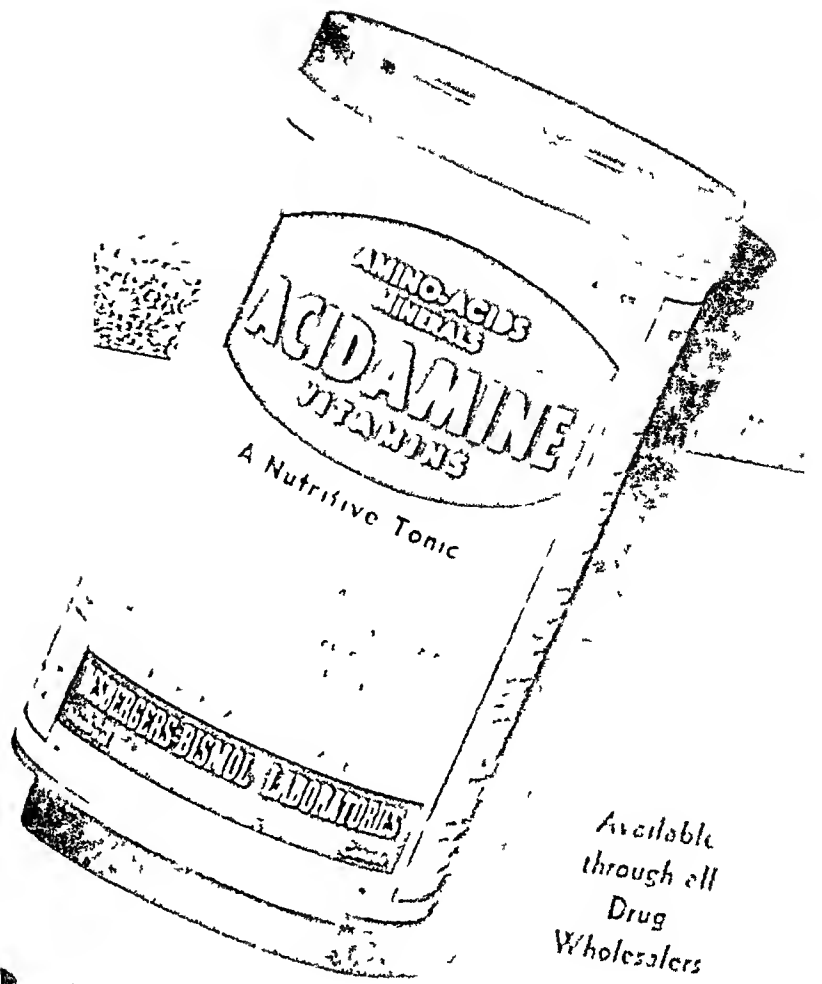
Three-Fold Approach to Para-nasal Therapy

1. The nasal meatus by 20 per cent ARGYROL instillations through the nasolacrimal duct
2. The nasal passages with 10 per cent ARGYROL solution in drops
3. The nasal cavities with 10 per cent ARGYROL by nasal tamponage

ARGYROL *the Physiologic
Anti-infective with broad, sustained action*

Made only by the **A C BARNES COMPANY LIMITED**, Ste Thérèse, Que
ARGYROL is a registered trade mark the property of A C BARNES Company Limited





Available
through all
Drug
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ACIDAMINE

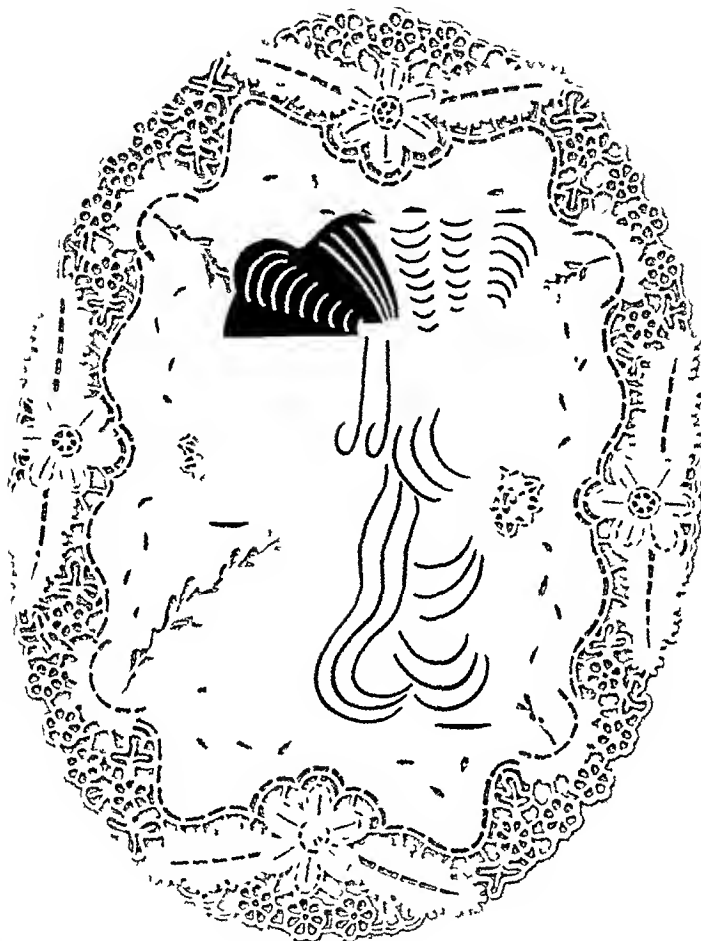
A New High in Amino Acids Therapy

A Palatable, Readily Assimilable,
Potent Tonic in Powder Form

ACIDAMINE synonym for palatability and high gastric
acceptance in Amino Acids Therapy. Incorporating
Vitamins and Minerals, this Tonic Nutrient is effective
in all manifestations of Hypoproteinaemia.
Produced by the Canadian Pioneer for the treatment of
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DESBERGERS-BISMOL LABORATORIES

MENOPAUSE



OESTRILIN TABLETS

(ESTROGENS DESBERGERS)

**NATURAL Conjugated Estrogenic Substances
FOR ORAL USE**

Plain or with Phenobarbital $\frac{1}{2}$ grain

DESBERGERS-BISMOL LABORATORIES

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Montreal, Canada



trichomonas vaginitis

*Rapid Relief and Less
Likelihood of Recurrence*

*R*apid eradication of the trichomonas parasite and disappearance of the disagreeable leukorrhea, burning and itching are commonly achieved with Devegan

*I*n addition to a powerful trichomonicide, Devegan contains special carbohydrates which favor the growth of lactobacilli and restoration of the normal vaginal acidity that greatly reduces the likelihood of recurrence

DEVEGAN

TRICHOMONICIDE - LACTOGEN - CRYSTALLINE

Powder for insufflation in 1 oz. bottles (thread fits H-eri spray Insufflator, No. 3662) Tablets for vaginal insertion

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 General Offices: New York, N.Y.

AT HOME OR AWAY

SPOT TESTS

SIMPLIFY URINALYSIS

NO TEST TUBES • NO MEASURING • NO BOILING

Diabetics welcome "Spot Tests" (ready to use dry reagents), because of the ease and simplicity in using. No test tubes, no boiling, no measuring, just a little powder, a little urine—color reaction occurs at once if sugar or acetone is present.

Galatest

FOR DETECTION OF SUGAR IN THE URINE

Acetone Test (Denco)

FOR DETECTION OF ACETONE IN THE URINE

THE SAME SIMPLE TECHNIQUE FOR BOTH

1 A LITTLE POWDER



2 A LITTLE URINE

COLOR REACTION IMMEDIATELY



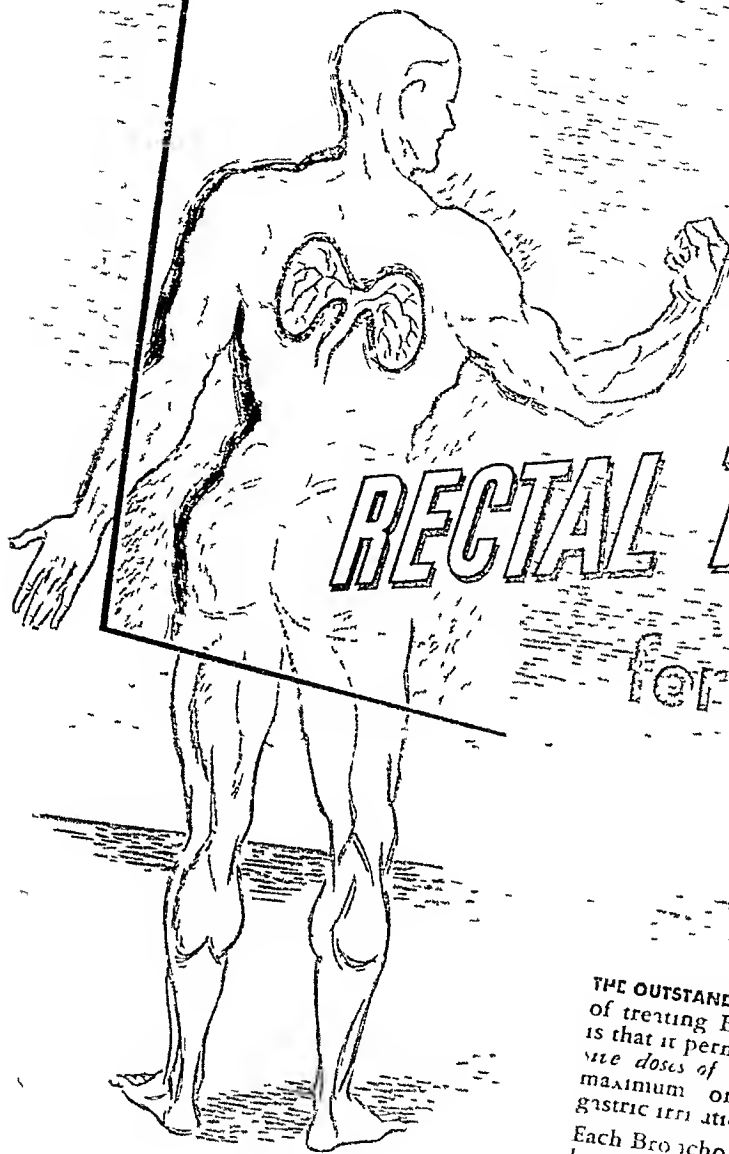
A carrying case containing one vial of Acetone Test (Denco) and one vial of Galatest is now available. This is very convenient for the medical bag or for the diabetic patient. The case also contains a medicine dropper and a Galatest color chart. This handy kit or refills of Acetone Test (Denco) and Galatest are obtainable at all prescription pharmacies and surgical supply houses.

Accepted for advertising in the Journal of the A M A

WRITE FOR DESCRIPTIVE LITERATURE

THE DENVER CHEMICAL MANUFACTURING COMPANY

286 St Paul Street, W, Montreal



Now...
RECTAL THERAPY
for Bronchitis

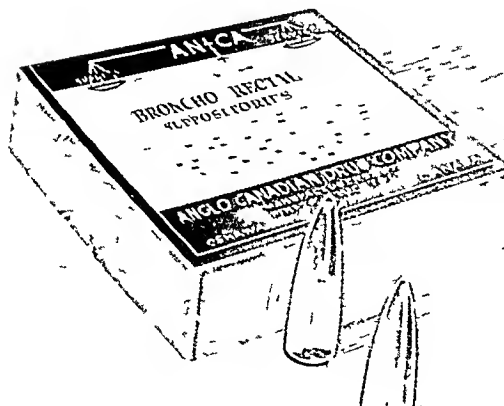
THE OUTSTANDING FACT about this new method of treating Broncho pulmonary conditions is that it permits the administration of *maximal doses of Creosote*—up to 45 times the maximum oral dose—without inducing gastric irritation

Each Broncho Rectal suppository is equivalent to 50 minims Creosote combined with glycerol. Rectal administration enables the Creosote to be taken directly into the blood stream and carried to the bronchi and bronchioles—the absorption being so rapid that Creosote odor may be detected on the patient's breath within 30 minutes

Broncho Rectal suppositories are antiseptic, mildly anesthetic and deodorant

Indications include chronic bronchitis, bronchitis, acute and post operative cough and asthma

There is NO reaction resulting from the ingredients





Styled for Individual Tastes

Neo-Synephrine for intranasal use is "styled" in three distinct forms too. All three provide the same real breathing comfort prompt decongestion that endures for hours. Only the vehicles are different— isotonic saline, unflavored, easily dispersed emulsion, jelly in applicator tubes for convenience.

Neo-Synephrine

HYDROCHLORIDE

LAEVO & HYDROXY & METHYLAMINO & (HOKOVI) ETHYLAMINE IN OROCHLORIDE

For Nasal Decongestion

THERAPEUTIC APPRAISAL. Quick acting, long lasting nasal decongestion without compensatory re-congestion, relatively free from cardiac and central nervous system stimulation consistently effective upon repeated use no appreciable interference with ciliary activity, isotonic to avoid irritation.

INDICATED for symptomatic relief in common cold, sinusitis, and nasal manifestations of allergy.



Samples Upon Request

ADMINISTRATION may be by dropper, spray or tampon, using the $\frac{1}{4}\%$ in saline the 1% in saline when a stronger solution is indicated. The $\frac{1}{4}\%$ jelly in tubes is convenient for patients to carry.

SUPPLIED as $\frac{1}{4}\%$ and 1% in isotonic salt solution, and as $\frac{1}{4}\%$ in an emulsion, bottles of 1 fl oz. $\frac{1}{8}\%$ jelly in $\frac{5}{8}$ oz. collapsible tubes with applicator.

Frederick Stearns & Company

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Neo-Synephrine Trade Mark Registered

ONLY *Libby's* **Baby Foods** **are HOMOGENIZED**



Homogenization increases vitamin potencies of Libby's Baby Foods

That an abundant vitamin supply is important to the growth and development of infants has long been acknowledged. Libby's strained and Homogenized Baby Foods not only contain relatively large amounts of the health-giving vitamins, but, by rendering nutrient extracellular, Libby's patented Homogenization process increases the vitamin potencies of the foods—assures that baby gets full benefit of the contained vitamins. In addition, by comminuting the large, cellulose fibres to extra small size, Homogenization renders these important, vitamin-bearing baby foods in a form

readily digested by infants as young as six weeks. These advantages are exclusive with Libby's Baby Foods because Libby's are the only baby foods which are Homogenized.

REPORTS ON CLINICAL AND LABORATORY STUDIES WILL BE SENT ON REQUEST

Garden Vegetables
Carrots
Peas
Spinach
Liver Soup
Vegetable Beef Soup
Vegetable Soup
Prunes
Apples and Apricots
Custard Pudding
Libby's Homogenized
Evaporated Milk

LIBBY'S PROCESS OF HOMOGENIZATION

- 1 Opens cell capsules, releases contained nutriment, and disperses it homogeneously throughout
- 2 Comminutes indigestible cell membranes and coarse cellulose fibres
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- 4 Increases availability of the contained nutrients, thus facilitating utilization
- 5 Renders cellulose mechanically bland, without impairing physiologic effect of bulk on intestinal motility

Libby's
HOMOGENIZED
(EXTRACELLULAR)
BABY FOODS

BFM 5 46

Codophen E.B.S.

is Triple Acting . . .

ANALGESIC .

The combined action of three analgesics, acetylsalicylic acid, phenacetine and codeine phosphate, ensures the rapid easing of most types of pain

ANTIPYRETIC . . .

Acetylsalicylic acid and phenacetine are both familiar agents for the reduction of fever

SEDATIVE . . .

Codeine phosphate provides safe and sure relaxation of taut nerves

**TWO
STRENGTHS**

CT #260 Codophen, EBS

Ebsal EBS (Acetylsalicylic Acid)	3 grs
Phenacetine	2 grs
Caffeine Citrate	¼ gr
Codeine Phosphate	¼ gr

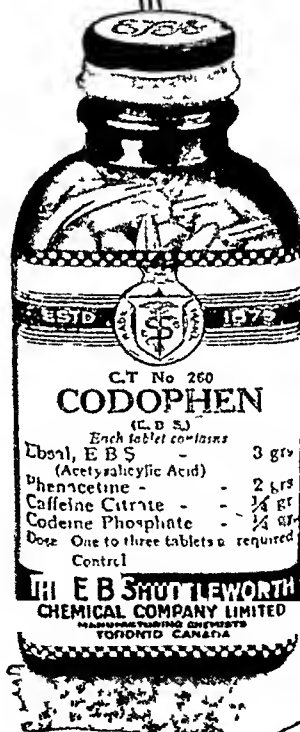
These tablets are a pale orange color

CT #260A Codophen Stronger, EBS

Ebsal EBS (Acetylsalicylic Acid)	3 grs
Phenacetine	2 grs
Caffeine Citrate	¼ gr
Codeine Phosphate	½ gr

These tablets are a deep orange color

When prescribing, specify "EBS"
THUS CT #260 Codophen, EBS
—or—CT #260A Codophen
Stronger, EBS



ANALGESIC

ANTIPYRETIC

SEDATIVE

The E. B. Shuttleworth Chemical Co. Ltd.
525 Logan Avenue, Toronto 6
A wholly Canadian Company
ESTABLISHED 1879



• THE QUALITY SYMBOL •
OF PHARMACEUTICAL PRODUCTS



A Delicious Vitamin Food for Infants, Children and Adults at All Seasons

By presenting valuable nutrition elements and important vitamins in a delicious form "VIMALTOL" offers special advantages in everyday practice to the physician. With its delightfully sweet orange flavour "VIMALTOL" is readily acceptable to every patient.

"VIMALTOL" is made from Malt Extract and orange juice concentrate, together with the Vitamins A, B₁, D, Riboflavin (B₂), Niacin, and the minerals Iron, Calcium, Phosphorus.

"VIMALTOL" has therefore an important therapeutic value where the deficiency of certain essential food elements in the dietary has resulted in abnormal conditions. Its regular use assists the development of the growing organism and the maintenance of correct metabolism while raising the general resistance against infection.

"VIMALTOL" has thus a very wide application in general practice for patients of all ages. It can be prescribed with advantage at all seasons.

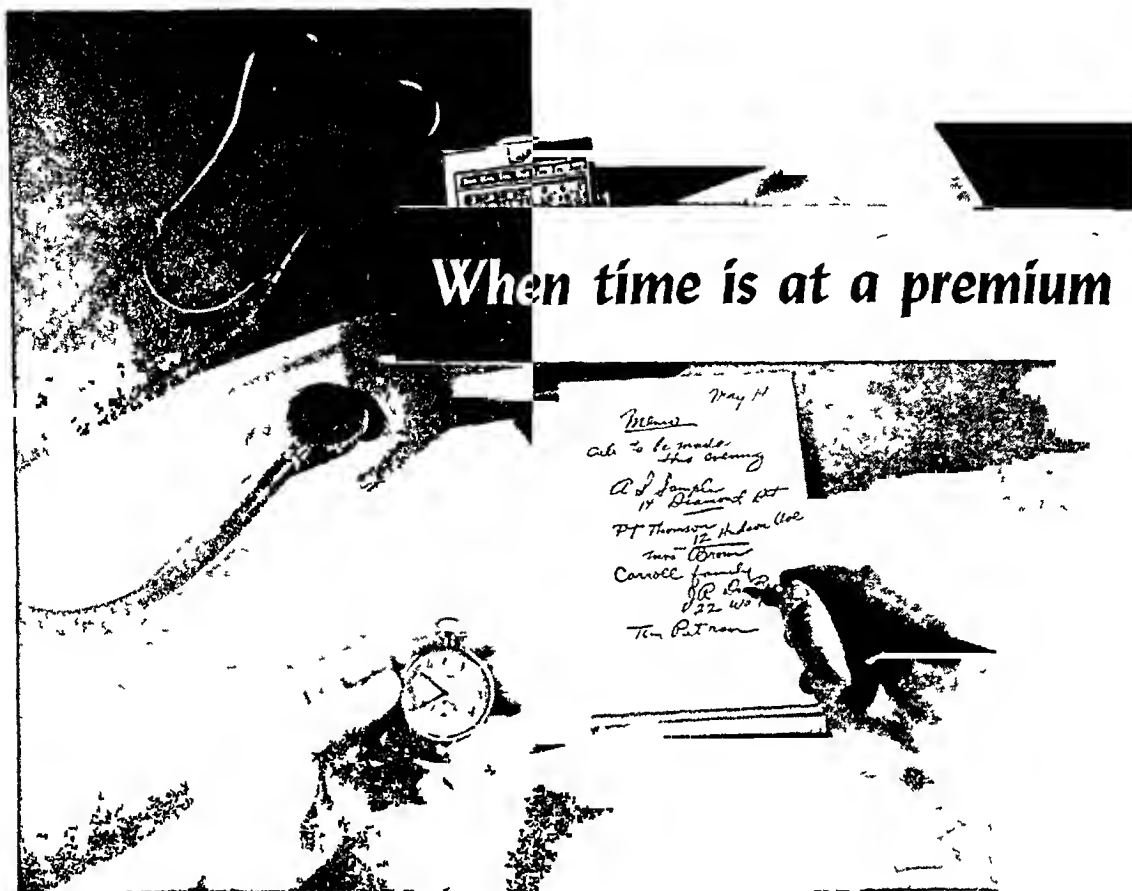
VIMALTOL

The recommended daily dose for adults provides the following important food factors:

Vitamin A	2,000 I U	Calcium	5 mgs
Vitamin D	400 I U	Phosphorus	17.5 mgs
Vitamin B ₁ (333 I U)	1 mg	Protein	0.9 gm
Riboflavin (B ₂)	1 mg	Carbohydrates	12 mgs
Niacin	10 mgs	Fat	0.07 g
Iron	10 mgs	Calories	33

A. WANDER LIMITED

PETERBOROUGH, CANADA



PYRIDIUM

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"Cans and foods are sterilized in the (canning) processing But the dish into which the food might be emptied is far from sterile In other words it may have on it bacteria that cause food spoilage Whether in the original can or in another container, the principal precautions for keeping food are—keep it cool and keep it covered"

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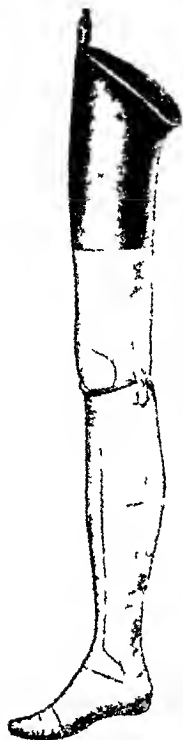
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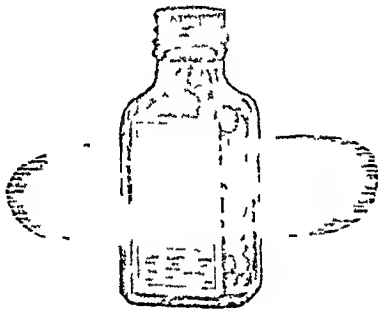
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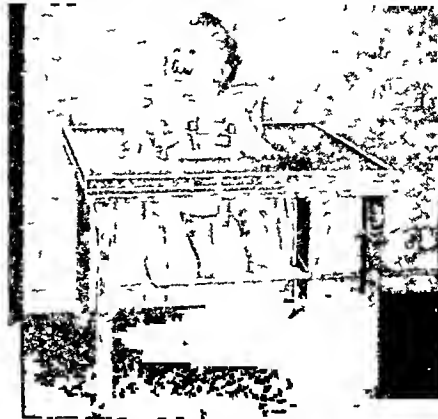
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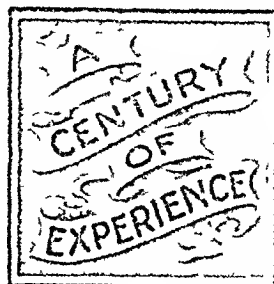
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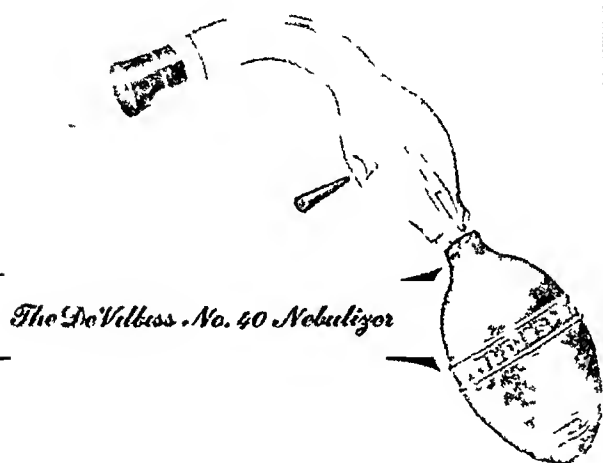
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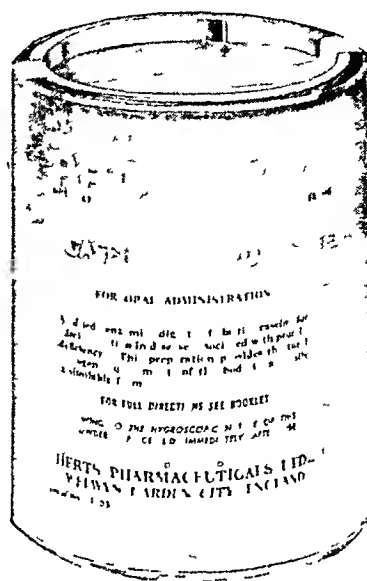
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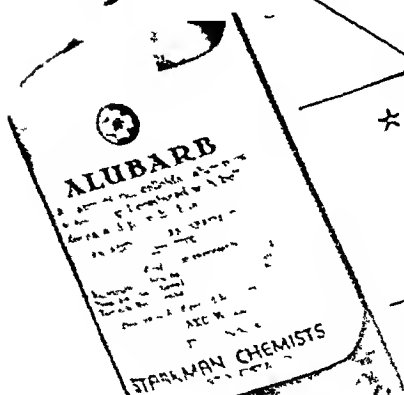
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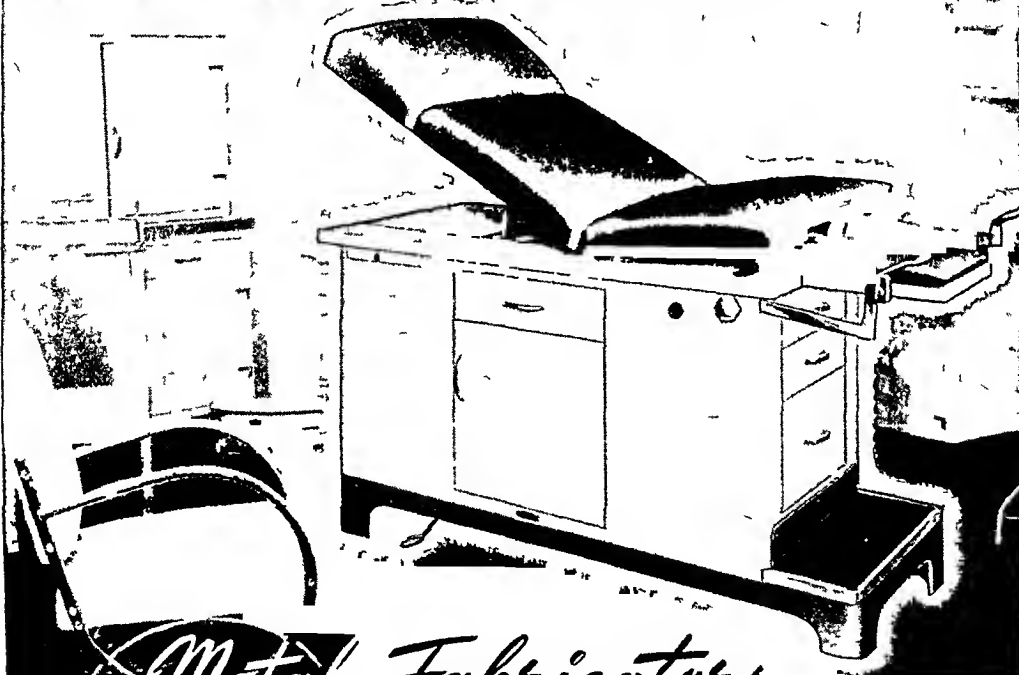
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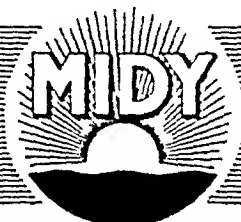
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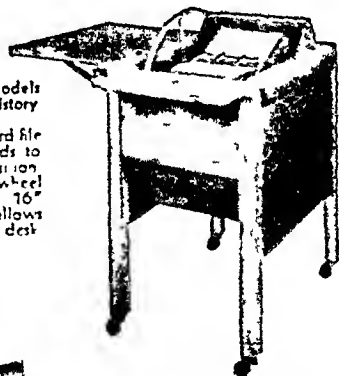
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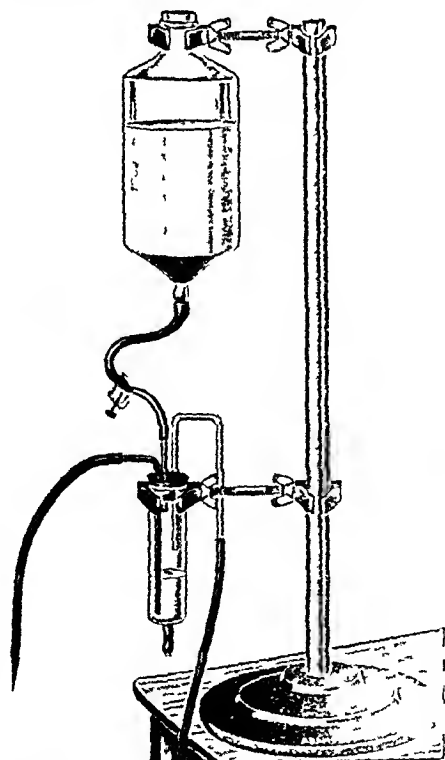


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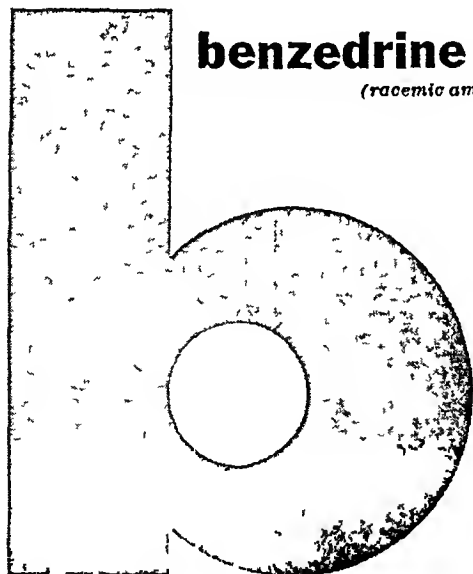
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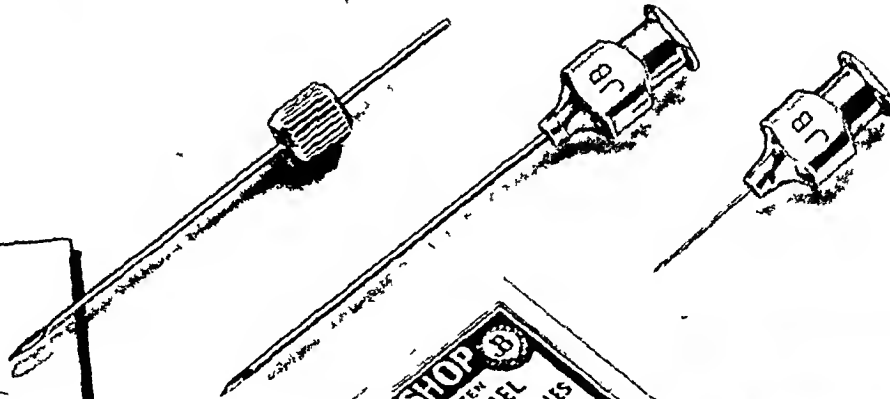
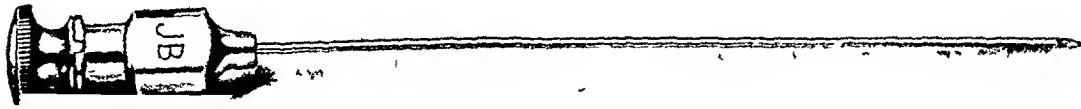
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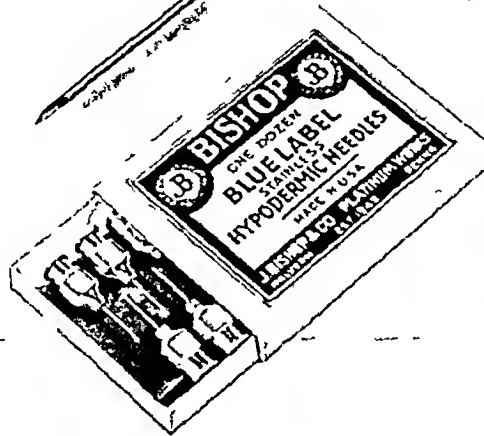
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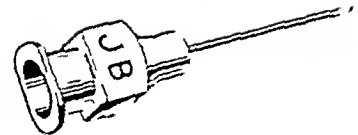


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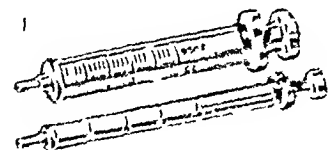
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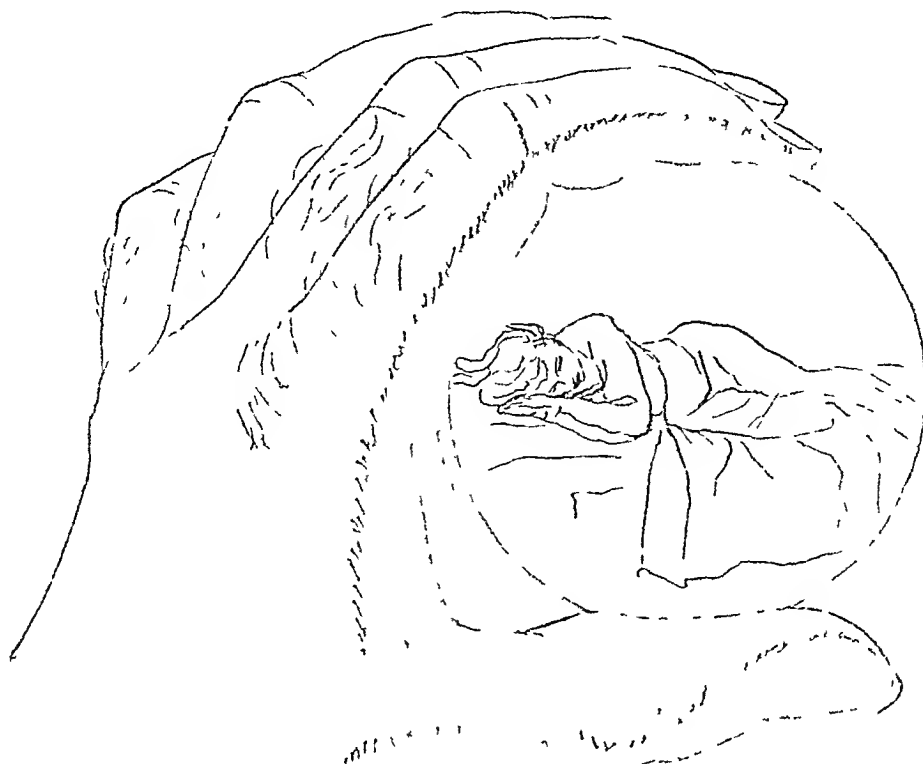


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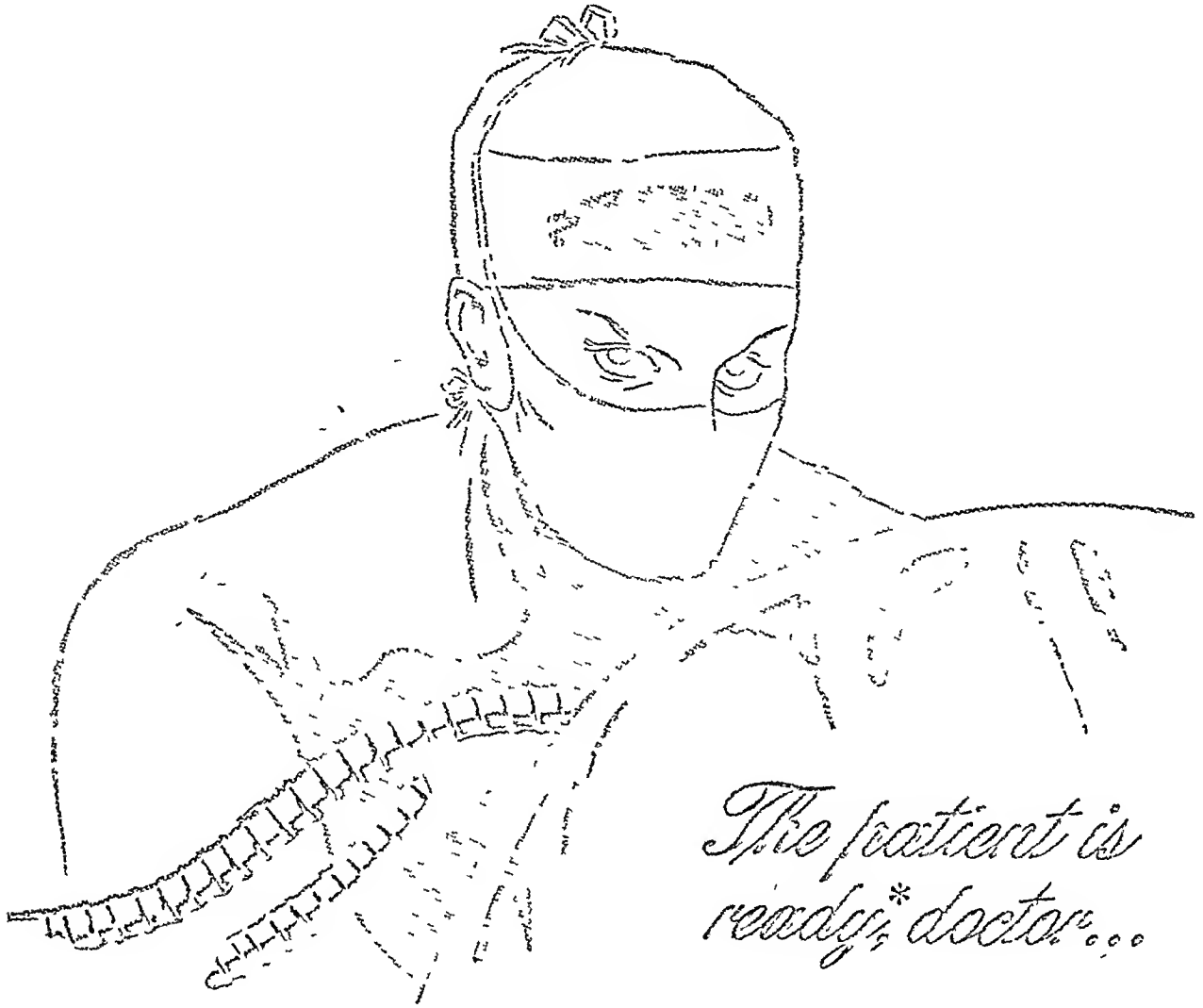
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*The patient is
ready,* doctor...*

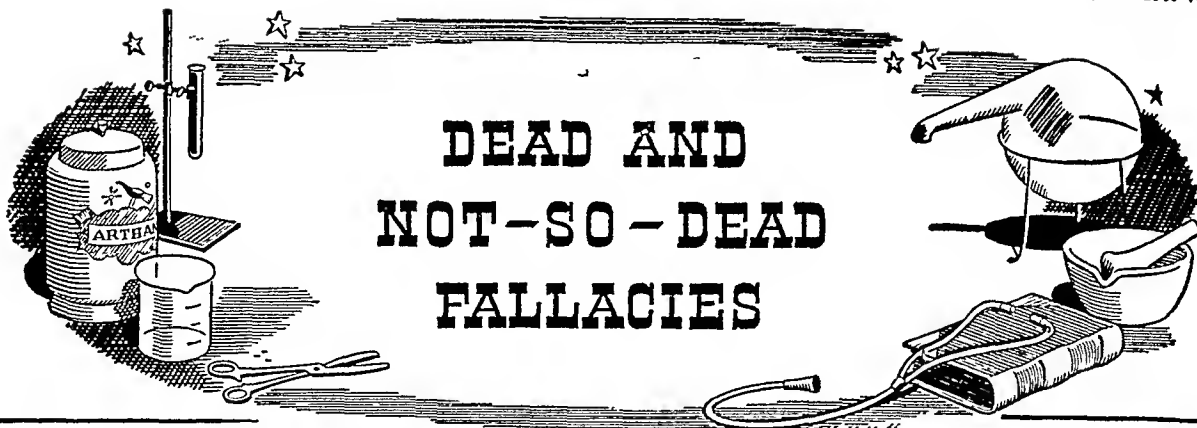
* 1 Anesthesia commenced 2 Opera-
tional area prepared and 3 Abdominal
muscles completely relaxed Deep anesthesia
to produce complete relaxation of abdomi-
nal muscles is unnecessary, when Intocostrin
is employed

Administered intravenously, Intocostrin
acts rapidly, profoundly and briefly The ab-
domen becomes relaxed and quiet, the intes-
tines retracted Both surgical manipulation

and closure are greatly facilitated

Intocostrin is a purified and standardized
extract of curare (*chondodendron tomento-
sum*) which produces muscular relaxation
through a readily-reversible myoneural
block It may be used with cyclopropane,
ether, nitrous oxide, ethylene; or sodium pen-
tothal

For literature write E. R. Squibb & Sons Limited, 36 Caledonia Road, Toronto



DEAD AND NOT-SO-DEAD FALLACIES



Once-trusted "cure" for asthma An ash tree of about the same age as the patient was selected, and the patient led to it at midnight in moonlight A nail was driven into the tree through the patient's braided hair, which was then cut off



A fallacy that flourishes today is Canned foods are made unwholesome by freezing This has no foundation in fact True, some foods may be changed in appearance by freezing But their nutritive value is not affected.



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WITH EPHEDRINE

offers special advantages as a local application in infections of the nose, throat and ear.

The solution is neutral in reaction, a great advantage over solutions of sodium salts of the sulphonamide derivatives, which are generally of high alkalinity and unsuitable for local application.

In the combination of Soluseptazine with Ephedrine, the vasoconstrictor action of the latter drug tends to delay the dispersal of the active agent into the general circulation, thereby inducing a more prolonged local anti-infective action of the Soluseptazine

Soluseptazine with Ephedrine may be applied by atomizer, by dropper tube or by means of a swab or tampon.

Indications

CORYZA

RHINITIS

SINUSITIS

NASAL CONGESTION
with obstruction

NASO-PHARYNGITIS, Etc

Presented in bottles of 30 c c and 250 c.c.

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